

SPECIAL ISSUE CONTAINING THE PRELIMINARY ANNOUNCEMENT OF THE FOURTH CLEVELAND MEETING OF THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE AND ASSOCIATED SOCIETIES, DECEMBER 29, 1930, TO JANUARY 3, 1931. EDITED BY BURTON E. LIVINGSTON, PERMANENT SECRETARY

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The American Association for the Advancement of Science:

<i>Preliminary Announcement of the Fourth Cleveland Meeting:</i> PROFESSOR BURTON E. LIVINGSTON	537
<i>Local Committees and Section Representatives</i>	539
<i>General Officers of the Association and Committees for 1930</i>	539
<i>Organizations that are to Hold Sessions at Cleveland</i>	542
<i>The American Association Press Service</i>	544
<i>The American Association Prize</i>	545
<i>Transportation</i>	546
<i>Hotel Accommodations</i>	547
<i>Registration</i>	547
<i>Membership and Associateship</i>	548
<i>Information Service</i>	548
<i>Business Sessions</i>	548
<i>The Secretaries' Conference and the Academy Conference</i>	549
<i>Scientific Sessions of Sections and Societies</i>	549
<i>Scientific Events:</i>	
<i>The British Freshwater Biological Station; Celebration of the Twenty-fifth Anniversary of the Theory of Relativity; Joint Meeting at Los Angeles of the American Physical Society and the Acoustical Society of America</i>	554
<i>Scientific Notes and News</i>	555

Discussion:

<i>The "Mad Itch" of Cattle:</i> DR. RICHARD E. SHORE.	
<i>The Sorting Power of Wind and Wave:</i> PROFESSOR JUNIUS HENDERSON. <i>A Terrestrial Amphipod in the United States:</i> DR. J. PAUL VISSCHER and CHESTER S. HEIMLICH. <i>Plant Lice Pumping in Unison:</i> W. LEE TANNER	559
<i>Special Correspondence:</i>	
<i>A National System of Experimental Forests and Ranges:</i> L. F. KNEIPP	560
<i>Scientific Apparatus and Laboratory Methods:</i>	
<i>Culture Media for Opalinidae:</i> PROFESSOR MAYNARD M. METCALF. <i>Rapid Staining of Plant Tissues in the Butyl Alcohol Procedure:</i> R. O. EARL	561
<i>Science News</i>	x

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

PRELIMINARY ANNOUNCEMENT OF THE FOURTH CLEVELAND MEETING

Edited by Professor BURTON E. LIVINGSTON

PERMANENT SECRETARY

THE fifteen sections of the American Association together with about forty independent societies will hold scientific sessions at Cleveland in convocation week. This will be the fourth time the association has met in Cleveland. Earlier Cleveland meetings were in July, 1853 (when the association was only five years old); in August, 1888, and in convocation week of 1912-13. Many persons will remember the third Cleveland meeting, which was very successful. Western Reserve University, the Case School of Applied Science and the Cleveland Chamber of Commerce have united in preparations for the meeting

this year and arrangements for an unusually large and interesting meeting are nearing completion. Much of the extra cost of the meeting is to be met from a locally raised fund, which has been guaranteed up to \$7,500. From registration fees and other current funds the association will probably expend \$6,000 or more in connection with this meeting.

The sessions for the natural and exact sciences are to be held mainly in the rooms of Western Reserve University and the Case School of Applied Science. These institutions are adjacent to each other and about four miles from the hotel district, with con-

venient and very efficient transportation. The societies dealing with social and economic sciences will hold their sessions in the hotels. These societies have preferred to make their own local arrangements and they will operate their own registration office. The American Association has arranged with the railway organizations for reduced railway rates, as usual. Any one may take advantage of these rates by securing a certificate for the A. A. A. S. meeting when purchasing his ticket to Cleveland. It is to be noted, however, that these association certificates may be validated only through the association's own registration office, which will be located in the gymnasium building, Western Reserve University. The office will open on Monday morning, December 29, at 9 o'clock and will remain in operation throughout the week; hours from 9 to 6.

This fourth Cleveland meeting will be the eighty-seventh meeting of the American Association and the annual meeting for the association year 1930-31, which began October first. All who are interested in the advancement of science and education are cordially invited to be present through the entire week of the meeting. All the scientific sessions are to be freely open to every one. The general program, published under the auspices of the association, will be available at the association's registration office at 9 o'clock on Monday and throughout the week. The book will be supplied free to all who register and may be purchased by others. Any person who does not attend the meeting may have a free copy of the program sent by mail if a request is addressed to the permanent secretary's office, Smithsonian Institution Building, Washington, D. C. Requests should be received before December 20.

General reports of this meeting are to appear in *SCIENCE* about February 1. A free copy of the reports may be secured if a request therefor is received by the permanent secretary before January 20. All who regularly receive *SCIENCE* will receive the reports without any special request.

The fourth Cleveland meeting of the American Association will be held under the presidency of Dr. Thomas Hunt Morgan, of the California Institute of Technology, eminent leader in zoological research. The retiring president this year is Dr. Robert A. Millikan, of the California Institute of Technology. Dr. Millikan is well known, not only for his eminently productive researches in physical science but also for his educational work and for his non-technical writings on the relation of science to human life. He will deliver the main lecture of the meeting at the opening session on Monday evening, December 29, in the Cleveland music hall, on "Atomic Disintegration and Atomic Synthesis."

The Sigma Xi lecture will be given at a general session on Tuesday evening, in the John Hay High School, the lecturer being Dr. C. E. K. Mees, of the Eastman Kodak Company. Dr. Mees's topic is announced as "The Science of Photography." The annual Josiah Willard Gibbs lecture, arranged by the American Mathematical Society, will be given at a general session on Tuesday afternoon by Dr. Edwin B. Wilson, of Harvard University. Dr. Wilson will speak on memories of Professor Gibbs and his work.

A general session is being planned on the various aspects of aquiculture, the growing of plants and animals in water. The Committee of One Hundred on Scientific Research is planning to hold a session on Tuesday at 2:30 in the Statler Hotel. Reports will be presented from some of the subcommittees, and plans for the future of the Committee of One-Hundred will be discussed. There will be evening general sessions on Wednesday and Thursday and several general sessions in the late afternoons. The Cleveland reception will be held on Monday evening, following the opening session.

The regular exhibition of apparatus, books and products useful in science teaching or in research will be unusually interesting this year. It will be housed in the gymnasium of Western Reserve University, along with the registration offices. There will be many exhibits of research methods and achievements of research as well as those placed by manufacturers and supply houses. This is the first time in recent years when special attention is being given to research exhibits and a new level of effectiveness is thus being introduced.

IMPORTANT NOTICES FOR THOSE PLANNING TO ATTEND THE FOURTH CLEVELAND MEETING

Those who plan to attend this meeting should engage hotel rooms at once, addressing the hotels. Whether the room desired is to be occupied by one or two persons should be stated, also the approximate price which the applicant wishes to pay and the date on which the room is to be occupied. If the sort of room requested is not available for the given date the hotel management will refer the request to the Cleveland Convention Board, which will tentatively assign a suitable room in another hotel, informing the applicant by letter. If the applicant does not wish to accept the assignment thus given he should inform the convention board, which will do its utmost to comply with his wishes.

All who are to present papers at this meeting should immediately send two copies of each paper to Mr. Austin H. Clark, director of the press service of the American Association, addressing them in the care of the permanent secretary's office in Washing-

ton. It is well to send a third copy to the section or society secretary in whose program the paper is to be presented. If the full manuscript can not be sent to Mr. Clark, be sure to send him two copies of an abstract.

When purchasing your railway ticket to Cleveland be sure to secure a certificate for the Cleveland meeting of the American Association for the Advancement of Science, and bring the certificate with you to the registration offices for the meeting.

LOCAL COMMITTEES AND SECTION REPRESENTATIVES

The general local committee for the Cleveland meeting has the following personnel. Most of the members are chairmen of special committees, as indicated.

Honorary Chairman, Robert E. Vinson, president of Western Reserve University.

Honorary Vice-chairman, William E. Wickenden, president of the Case School of Applied Science.

General Chairman, Harry W. Mountcastle, Western Reserve University.

Chairman of the Special Committee on Finance, Sidney S. Wilson, Western Reserve University.

Chairman of the Special Committee on Hotels, Transportation, Registration and Signs, Winfred G. Leutner, Western Reserve University.

Chairman of the Special Committee on Meeting Places, Harry W. Mountcastle, Western Reserve University.

Chairman of the Special Committee on Equipment, Theodore M. Focke, Case School of Applied Science.

Chairman of the Special Committee on Luncheons and Dinners, J. Paul Visscher, Western Reserve University.

Chairman of the Special Committee on General Sessions and Public Lectures, Dayton C. Miller, Case School of Applied Science.

Chairman of the Special Committee on Exhibitions, Henry B. Dates, Case School of Applied Science.

Chairman of the Special Committee on General Reception and Entertainment, Howard T. Karsner, Western Reserve University.

Chairman of the Special Committee on Press Relations, Charles F. Chapman, Case School of Applied Science.

The local representatives of the several association sections, who cooperate with the local committee in making arrangements for the society and section sessions, are named below.

LOCAL REPRESENTATIVES FOR SECTIONS

Section A (Mathematics), W. G. Simon, Western Reserve University.

Section B (Physics), D. C. Miller, Case School of Applied Science.

Section C (Chemistry), H. P. Lankelma, Western Reserve University.

Section D (Astronomy), J. J. Nassau, Case School of Applied Science.

Section E (Geology and Geography), J. E. Hyde, Western Reserve University.

Section F (Zoological Sciences), J. P. Visscher, Western Reserve University.

Section G (Botanical Sciences), F. J. Bacon, Western Reserve University.

Societies related to both Zoological and Botanical Sciences, A. H. Hersh, Western Reserve University.

Section H (Anthropology), T. Wingate Todd, Western Reserve University.

Section I (Psychology), H. Austin Aikins, Western Reserve University.

Section K (Social and Economic Sciences), Frank T. Carlton, Case School of Applied Science.

Section L (Historical and Philological Sciences), B. P. Bourland, Western Reserve University.

Section M (Engineering), F. H. Vose, Case School of Applied Science.

Section N (Medical Sciences), H. T. Karsner, Western Reserve University.

Section O (Agriculture), F. J. Bacon, Western Reserve University.

Section Q (Education), C. W. Hunt, Western Reserve University.

Societies related to the A. A. A. S. in general, T. M. Focke, Case School of Applied Science.

GENERAL OFFICERS OF THE ASSOCIATION AND COMMITTEES FOR 1930

President

Thomas Hunt Morgan, California Institute of Technology, Pasadena, Calif.

Retiring President

Robert A. Millikan, California Institute of Technology, Pasadena, Calif.

Vice-presidents, Retiring Vice-presidents and Secretaries of the Sections

Section A (Mathematics):

Vice-president, Gilbert Ames Bliss, University of Chicago, Chicago, Ill.

Retiring Vice-president, E. T. Bell, California Institute of Technology, Pasadena, Calif.

Secretary, Charles N. Moore, University of Cincinnati, Cincinnati, Ohio.

Section B (Physics):

Vice-president, F. K. Richtmyer, Cornell University, Ithaca, N. Y.

Retiring Vice-president, Charles E. Mendenhall, University of Wisconsin, Madison, Wis.

Secretary, A. L. Hughes, Washington University, St. Louis, Mo.

Section C (Chemistry):

Vice-president, James F. Norris, Massachusetts Institute of Technology, Cambridge, Mass.

Retiring Vice-president, Samuel Colville Lind, University of Minnesota, Minneapolis, Minn.

Secretary, R. R. Renshaw, New York University, New York, N. Y.

Section D (Astronomy):

Vice-president, D. W. Morehouse, Drake University, Des Moines, Iowa.

Retiring Vice-president, Harlow Shapley, Harvard University, Cambridge, Mass.

Secretary, Philip Fox, Adler Planetarium and Astronomical Museum, Chicago, Ill.

Section E (Geology and Geography):

Vice-president, Edson S. Bastin, University of Chicago, Chicago, Ill.

Retiring Vice-president, George Frederick Kay, University of Iowa, Iowa City, Iowa.

Secretary, Kirtley F. Mather, Harvard University, Cambridge, Mass.

Section F (Zoological Sciences):

Vice-president, William Albert Riley, University of Minnesota, Minneapolis, Minn.

Retiring Vice-president, Charles Manning Child, University of Chicago, Chicago, Ill.

Secretary, Geo. T. Hargitt, Duke University, Durham, N. C.

Section G (Botanical Sciences):

Vice-president, E. J. Kraus, University of Chicago, Chicago, Ill.

Retiring Vice-president, J. Arthur Harris, deceased.

Secretary, Sam F. Trelease, Columbia University, New York, N. Y.

Section H (Anthropology):

Vice-president, Carl E. Guthe, University of Michigan, Ann Arbor, Mich.

Retiring Vice-president, A. V. Kidder, Phillips Academy, Andover, Mass.

Secretary, Charles H. Danforth, Stanford University, Stanford University, Calif.

Section I (Psychology):

Vice-president, Edwin G. Boring, Harvard University, Cambridge, Mass.

Retiring Vice-president, Madison Bentley, Cornell University, Ithaca, N. Y.

Secretary, John E. Anderson, University of Minnesota, Minneapolis, Minn.

Section K (Social and Economic Sciences):

Vice-president, Leonard P. Ayres, Cleveland Trust Co., Cleveland, Ohio.

Retiring Vice-president, Henry Lewis Rietz, University of Iowa, Iowa City, Iowa.

Secretary, Charles F. Roos, Cornell University, Ithaca, N. Y.

Section L (Historical and Philological Sciences):

Vice-president, no election.

Retiring Vice-president, Henry Osborn Taylor, 135 East 66th St., New York, N. Y.

Secretary of the Committee on History of Science, Joseph Mayer, 26 Jackson Place, Washington, D. C.

Secretary of the Committee on Linguistics, Leonard Bloomfield, University of Chicago, Chicago, Ill.

Section M (Engineering):

Vice-president, Frank Baldwin Jewett, 195 Broadway, New York, N. Y.

Retiring Vice-president, H. F. Moore, University of Illinois, Urbana, Ill.

Secretary, N. H. Heck, U. S. Coast and Geodetic Survey, Washington, D. C.

Section N (Medical Sciences):

Vice-president, Louis B. Wilson, Mayo Foundation, Rochester, Minn.

Retiring Vice-president, Ludvig Hektoen, University of Chicago, Chicago, Ill.

Secretary, Charles W. M. Poynter, College of Medicine, University of Nebraska, Omaha, Nebraska.

Section O (Agriculture):

Vice-president, Walter Castella Coffey, University Farm, St. Paul, Minn.

Retiring Vice-president, Merritt F. Miller, University of Missouri, Columbia, Mo.

Secretary, P. E. Brown, Iowa State College, Ames, Iowa.

Section Q (Education):

Vice-president, Leonard V. Koos, University of Chicago, Chicago, Ill.

Retiring Vice-president, Frank N. Freeman, University of Chicago, Chicago, Ill.

Secretary, Willis L. Uhl, University of Washington, Seattle, Wash.

Permanent Secretary

Burton E. Livingston, Johns Hopkins University, Baltimore, Md. (Association mail address: Smithsonian Institution Building, Washington, D. C.)

General Secretary

Frank R. Lillie, University of Chicago, Chicago, Ill.

Treasurer

John L. Wirt, Carnegie Institution of Washington, Washington, D. C.

Secretary of the Council and Program Editor

Sam F. Trelease, Columbia University, New York, N. Y.

Executive Assistant

Sam Woodley, Smithsonian Institution Building, Washington, D. C.

Auditor

A. G. McCall, U. S. Department of Agriculture, Washington, D. C.

Director of the Press Service

Austin H. Clark, U. S. National Museum, Washington, D. C.

The Council of the Association

The council consists of: (1) the president, the general secretary, the permanent secretary and the treasurer; (2) the members of the executive committee not otherwise members of the council; (3) the chairmen of the sections; (4) the section secretaries; (5) the representatives of the affiliated organizations, and (6) eight elected members. The elected members of the council are as follows, the number shown in parentheses being that of the calendar year at the end of which the member's term of office is to expire.

John C. Merriam (1933), Carnegie Institution of Washington, Washington, D. C.

Rodney H. True (1933), University of Pennsylvania, Philadelphia, Pa.

L. O. Howard (1932), U. S. Department of Agriculture, Washington, D. C.

D. T. MacDougal (1932), Desert Laboratory, Tucson, Ariz.

Austin H. Clark (1931), U. S. National Museum, Washington, D. C.

Arthur H. Compton (1931), University of Chicago, Chicago, Ill.

L. E. Dickson (1930), University of Chicago, Chicago, Ill.

David White (1930), U. S. Geological Survey, Washington, D. C.

Members of the Executive Committee of the Council
J. McKeen Cattell (1930), *chairman*; Garrison-on-Hudson, N. Y.

Karl T. Compton (1933), Massachusetts Institute of Technology, Cambridge, Mass.

David R. Curtiss (1931), Northwestern University, Evanston, Ill.

Joel H. Hildebrand (1931), University of California, Berkeley, Calif.

Vernon Kellogg (1932), National Research Council, Washington, D. C.

Frank R. Lillie (1932), *general secretary*; University of Chicago, Chicago, Ill.

Burton E. Livingston (1932), *permanent secretary*; Johns Hopkins University, Baltimore, Md.

Robert A. Millikan (1933), California Institute of Technology, Pasadena, Calif.

Thomas Hunt Morgan (1930), *president of the association*; California Institute of Technology, Pasadena, Calif.

Henry B. Ward (1930), University of Illinois, Urbana, Ill.

Edwin B. Wilson (1932), Harvard School of Public Health, Boston, Mass.

*Members of the Committee on Grants for Research*²

Arthur H. Compton (1933), *chairman of the committee*, for Physics; University of Chicago, Chicago, Ill.

George H. Parker (1933), for Zoology; Harvard University, Cambridge, Mass.

Charles P. Berkey (1932), for Geology; Columbia University, New York, N. Y.

William Charles White (1932), for Medicine; Hygienic Laboratory, U. S. Public Health Service, Washington, D. C.

Walter S. Adams (1931), for Astronomy; Mount Wilson Observatory, Pasadena, Calif.

Karl F. Kellerman (1931), for Botany; U. S. Department of Agriculture, Washington, D. C.

W. Lash Miller (1930), for Chemistry; University of Toronto, Toronto, Ont., Canada.

¹ The number in parentheses denotes the calendar year at the end of which the member's term of office is to expire.

² The number in parentheses denotes the year at the end of which the member's term of office is to expire.

Oswald Veblen (1930), for Mathematics; Princeton University, Princeton, N. J.

Members of the Finance Committee

George K. Burgess (1932), *chairman of the committee*; U. S. Bureau of Standards, Washington, D. C.

Arthur L. Day (1931), Geophysical Laboratory, Carnegie Institution of Washington, Washington, D. C.

A. S. Frissell (1933), 530 Fifth Avenue, New York, N. Y.

Herbert Gill (1930), Bethesda, Md.

John L. Wirt (1932), *treasurer of the association*; Carnegie Institution of Washington, Washington, D. C.

The Standing Committee of One Hundred on Scientific Research

Chairman, Thomas Hunt Morgan, president of the American Association; California Institute of Technology, Pasadena, Calif.

Secretary, Rodney H. True, University of Pennsylvania, Philadelphia, Pa.

The Secretaries' Conference

Chairman, Philip Fox, Adler Planetarium and Astronomical Museum, Chicago, Ill.

Secretary, H. J. Van Cleave, University of Illinois, Urbana, Ill.

The Academy Conference

Chairman, D. W. Morehouse, Drake University, Des Moines, Iowa.

Secretary, Chancey Juday, University of Wisconsin, Madison, Wis.

The Committee on the Place of Science in Education

Chairman, Otis W. Caldwell, Columbia University, New York, N. Y.

The Committee on Source Books in the History of Science

Chairman, Gregory D. Walcott, Long Island University, Brooklyn, N. Y.

The Committee on Popular Science Booklists

Chairman, Joseph L. Wheeler, Enoch Pratt Free Library, Baltimore, Md.

The Committee on Exhibition

H. E. Howe, *chairman*, Editor, *Journal of Industrial and Engineering Chemistry*.

C. E. K. Mees, Eastman Kodak Co., Rochester, N. Y.

L. M. Potter, Spencer Lens Company, Buffalo, N. Y.

M. E. Leeds, Leeds and Northrup Company, Philadelphia, Pa.

J. Edward Patterson, Arthur H. Thomas Company, Philadelphia, Pa.

Edward Weston, Weston Electrical Instrument Corp., Newark, N. J.

Thomas H. Morgan, *president of the association*, California Institute of Technology, Pasadena, Calif.

Burton E. Livingston, *permanent secretary of the association*, Smithsonian Institution Building, Washington, D. C.

H. S. Kimberly, *manager of the exhibition*, Smithsonian Institution Building, Washington, D. C.

The Committee on Research Exhibits

- F. C. Brown, *chairman*; Museums of the Peaceful Arts, New York.
- Owen Cattell, *secretary*; The Science Press, Grand Central Terminal, New York, N. Y.
- William Crocker, Boyce Thompson Institute for Plant Research, Yonkers, N. Y.
- F. M. Delano, New York Electrical Society, 29 West 39th Street, New York, N. Y.
- H. E. Howe, Editor, *Journal of Industrial and Engineering Chemistry*, Washington, D. C.
- Dayton C. Miller, Case School of Applied Science, Cleveland, Ohio.
- William A. Riley, University of Minnesota, Minneapolis, Minn.

ORGANIZATIONS THAT ARE TO HOLD SESSIONS
AT CLEVELAND, WITH DATES OF THEIR
SESSIONS AND OTHER INFORMATION

Note.—Names of organizations are arranged in the order of association sections. Each affiliated society has one or two representatives in the association council, as indicated by one or two asterisks before the society name. A cross before a name indicates that the society is associated but not affiliated. The president and secretary are named for each society, and the council representatives for the affiliated societies. Officers of the sections of the association have been named in an earlier part of this announcement. Dates of meetings are to be read as inclusive. Hotel headquarters and meeting places are generally shown but in a few instances some data are omitted because of lack of information.

A. Mathematics.

** American Mathematical Society. December 29, 30 and 31. Headquarters, Hotel Statler; meeting places, Auditorium and Rooms 216, 219 and 312, School of Education, Western Reserve University. *President*, E. R. Hedrick; *secretary*, R. G. D. Richardson, Brown University, Providence, R. I.; *council representatives*, T. H. Hildebrandt and Louis Ingold.

** Mathematical Association of America. January 1. Headquarters, Hotel Statler; meeting place, Auditorium, School of Education, Western Reserve University. *President*, J. W. Young; *secretary*, W. D. Cairns, Oberlin College, Oberlin, Ohio; *council representatives*, W. D. Cairns and Dunham Jackson.

B. Physics.

** American Physical Society. December 30 and 31. Headquarters, Hotel Statler; meeting place, lecture room, Physics Building, Western Reserve University, and Room 86, Physics Building, and Room 105, Chemistry Building, Case School of Applied Science. *President*, Henry G. Gale; *secretary*, W. L. Severinghaus, Columbia University, New York, N. Y.; *council representatives*, Dayton C. Miller and G. W. Stewart.

* American Meteorological Society. December 29 and 30. Headquarters, Hotel Statler; meeting place, Room 206, Mining Building, Case School of Applied Science. *President*, John Patterson; *secretary*, Charles F. Brooks, Clark University, Worcester, Mass.; *council representa-*

tive, W. J. Humphreys, U. S. Weather Bureau, Washington, D. C.

C. Chemistry.

Section C. December 30. Headquarters, Hotel Winton; meeting place, Room 23, Chemistry Building, Western Reserve University.

D. Astronomy.

Section D. December 30 and 31. Headquarters, Hotel Statler; meeting place, Room 69, Main Building, Case School of Applied Science.

E. Geology and Geography.

Section E. December 31 and January 1 and 2. Headquarters, Hotel Winton; meeting place, Room 206, Mining Building, Case School of Applied Science.

F. Zoological Sciences.

** American Society of Zoologists. December 30 and 31 and January 1. Headquarters, Hotel Hollenden; meeting place, John Hay High School. *President*, H. V. Neal; *secretary*, Dwight E. Minnich, University of Minnesota, Minneapolis, Minn.; *council representatives*, H. H. Newman and P. W. Whiting.

** Entomological Society of America. December 30 and 31. Headquarters, Hotel Hollenden; meeting place, Room 10, Mechanical Building, Case School of Applied Science. *President*, Edith M. Patch; *secretary*, J. J. Davis, Purdue University, Lafayette, Ind.; *council representatives*, A. L. Melander and W. A. Riley.

** American Association of Economic Entomologists. December 29 to January 3. Headquarters, Hotel Hollenden; meeting place, Room 24, Electricity Building, Case School of Applied Science. *President*, Franklin Sherman; *secretary*, Albert F. Burgess, 964 Main St., Melrose Highlands, Mass.; *council representatives*, W. E. Hinds and M. H. Swenk.

** American Society of Parasitologists. December 29, 30 and 31 and January 1. Headquarters, Hotel Hollenden; meeting place, Amphitheater, Institute of Pathology, Western Reserve University. *President*, W. W. Cort; *secretary*, N. R. Stoll, Rockefeller Institute for Medical Research, Princeton, N. J.; *council representatives*, Franklin D. Barker and Henry B. Ward.

† Wilson Ornithological Club. December 29 and 30. Headquarters, Hotel Hollenden; meeting place, Room 32, Clark Hall, College for Women, Western Reserve University. *President*, J. W. Stack; *secretary*, Jesse M. Shaver, George Peabody College for Teachers, Nashville, Tenn.

G. Botanical Sciences.

** Botanical Society of America. December 30 and 31 and January 1. Headquarters, Hotel Hollenden; meeting place, Geology Building, Western Reserve University. *President*, Lester W. Sharp; *secretary*, Arthur J. Eames, Cornell University, Ithaca, N. Y.; *council representatives*, Margaret C. Ferguson and I. F. Lewis.

** American Phytopathological Society. December 30 and 31 and January 1. Headquarters, Hotel Hollenden; meeting places, Tuesday morning, December 30, Auditorium, Medical Library Building; Tuesday afternoon, December 30, Room 35, Main Building, Western Reserve

University; Wednesday afternoon, Rooms 34, 35, and 37, Main Building, Western Reserve University; Thursday morning, Rooms 34 and 35, Main Building, Western Reserve University, and Auditorium, Medical Library Building; Thursday afternoon, Rooms 34, 35, and 37, Main Building, Western Reserve University. *President*, H. S. Fawcett; *secretary*, F. C. Meier, Bureau of Plant Industry, U. S. Department of Agriculture, Washington, D. C.; *council representatives*, C. W. Edgerton and Donald Reddick.

**** American Society of Plant Physiologists.** December 29, 30 and 31 and January 1. Headquarters, Hotel Hollenden; meeting place, Freshman Classroom, Law School, Western Reserve University. *President*, H. R. Kraybill; *secretary*, W. A. Gardner, Alabama Polytechnic Institute, Auburn, Ala.; *council representatives*, Charles A. Shull and P. D. Strausbaugh.

F-G. Societies related to both Section F and Section G.

**** American Society of Naturalists.** Headquarters, Hotel Hollenden; meeting place, Auditorium, Medical Library Building. *President*, A. F. Blakeslee; *secretary*, L. J. Cole, University of Wisconsin, Madison, Wis.; *council representatives*, Herbert Kendall Hayes and A. Franklin Shull.

**** Ecological Society of America.** December 30 and 31 and January 1. Headquarters, Hotel Hollenden; meeting place, Room 33, Main Building, Western Reserve University. *President*, J. E. Weaver; *secretary*, A. O. Weese, University of Oklahoma, Norman, Okla.; *council representatives*, W. C. Allee and George P. Burns.

**** American Microscopical Society.** January 2. Headquarters, Hotel Hollenden; meeting place, Room 205, John Hay High School. *President*, D. H. Wenrich; *secretary*, H. J. Van Cleave, University of Illinois, Urbana, Ill.; *council representatives*, H. J. Van Cleave and D. H. Wenrich.

† **Phi Sigma Biological Research Society.** December 31 and January 1. Headquarters, Hotel Hollenden; meeting place, Room 6, Main Building, Western Reserve University. *President*, P. B. Sears; *secretary*, A. I. Ortenburger, University of Oklahoma, Norman, Okla.

Genetics Sections, American Society of Zoologists and Botanical Society of America. December 30 to January 3. Meeting place, lecture room and laboratory, Biology Building, Western Reserve University. *Chairman*, L. J. Cole; *secretary*, P. W. Whiting, University of Pittsburgh, Pittsburgh, Pa.

H. Anthropology.

**** American Anthropological Association.** December 29, 30 and 31. Headquarters, Hotel Winton; meeting place, School of Medicine, Western Reserve University. *President*, A. M. Tozzer; *secretary*, A. Irving Hallowell, University of Pennsylvania, Philadelphia, Pa.; *council representatives*, E. A. Hooton and Aleš Hrdlička.

† **American Folk-Lore Society.** December 29, 30 and 31. Headquarters, Hotel Winton; meeting place, School of Medicine, Western Reserve University. *President*, Edward Sapir; *secretary*, Gladys A. Reichard, Barnard College, New York, N. Y.

American Association of Physical Anthropologists. December 29, 30 and 31. Headquarters, Hotel Winton; meeting place, School of Medicine, Western Reserve University. *President*, Aleš Hrdlička; *secretary*, Dudley J. Morton, College of Physicians and Surgeons, Columbia University, New York, N. Y.

I. Psychology.

Section I. January 2. Headquarters, Hotel Winton; meeting place, Room 33, Main Building, Western Reserve University.

K. Social and Economic Sciences.

Section K. December 29. Headquarters, Hotel Cleveland.

† **American Statistical Association.** Headquarters, Hotel Statler. *President*, Malcolm C. Rorty; *secretary*, Willford I. King, 236 Wooster Street, New York, N. Y.

† **American Sociological Society.** Headquarters, Hotel Hollenden. *President*, William F. Ogburn; *secretary*, Ernest W. Burgess, University of Chicago, Chicago, Ill.

† **American Economic Association.** Headquarters, Hotel Cleveland. *President*, M. B. Hammond; *secretary*, F. S. Deibler, Northwestern University, Evanston, Ill.

Other societies meeting in Cleveland with the social-science group are named below. Our information concerning their plans is very incomplete at this time.

Meeting at Hotel Statler: American Political Science Association.

Meeting at Hotel Winton: Stable Money Association.

Meeting at Hotel Cleveland: American Association for Labor Legislation, American Association of Teachers of Marketing and Advertising, American Association of University Instructors in Accounting, Farm Economics Association.

† **Metrie Association.** December 29. Headquarters and meeting place, Hotel Statler. *President*, George F. Kunz; *secretary*, Howard Richards, 156 Fifth Avenue, New York, N. Y.

L. Historical and Philological Sciences.

**** History of Science Society.** December 30 and 31. Headquarters, Hotel Winton; meeting place, Room 27, Main Building, Western Reserve University. *President*, Henry Crew; *secretary*, Frederick E. Bransch, Library of Congress, Washington, D. C.; *council representatives*, F. B. Dains and Joseph Mayer.

M. Engineering.

Section M. December 30 and 31. Headquarters, Hotel Winton; meeting place, Room 12, Electricity Building, Case School of Applied Science.

* **Institute of Radio Engineers (Cleveland Section).** *President*, Lee de Forest; *secretary*, Harold P. Westman, 33 West 39th St., New York, N. Y.; *chairman of Cleveland section*, D. Schregardus, Ohio Bell Telephone Co., 750 Huron Road, Cleveland, Ohio; *council representative*, J. C. Jensen.

N. Medical Sciences.

Section N. Headquarters, Hotel Hollenden.

American Society of Tropical Medicine. Headquarters, Hotel Hollenden; meeting place, Room 109, Institute of Pathology, Western Reserve University. *Secre-*

tary, E. Peterson, Box 131, Pennsylvania Ave. Station, Washington, D. C.

O. Agriculture.

** American Society of Agronomy. December 29 and 30. Headquarters, Hotel Hollenden; meeting place, lecture room, Biology Building, and Law School, Western Reserve University. *President*, W. P. Kelley; *secretary*, P. E. Brown, Iowa State College, Ames, Iowa; *council representatives*, Jay B. Park and John B. Wentz.

* American Society for Horticultural Science. December 29, 30 and 31. Headquarters, Hotel Hollenden; meeting place, Middle Classroom and Senior Classroom, Law School, Western Reserve University. *President*, A. T. Erwin; *secretary*, H. B. Tukey, New York State Agricultural Experiment Station, Geneva, N. Y.; *council representative*, W. H. Alderman.

† Association of Official Seed Analysts of North America. December 31 and January 1 and 2. Headquarters, Hotel Hollenden; meeting place, Room 29, Main Building, Western Reserve University. *President*, A. L. Stone; *secretary*, F. S. Holmes, College Park, Md.

† Potato Association of America. December 30 and 31. Headquarters, Hotel Hollenden; meeting place, Room 23, Main Building, Western Reserve University. *President*, John Bushnell; *secretary*, H. C. Moore, Michigan State College, East Lansing, Mich.

Geneticists Interested in Agriculture. December 29. Meeting place, lecture room, Biology Building, Western Reserve University. *Secretary*, Fred Griffie, Agricultural Experiment Station, Orono, Maine.

Q. Education.

Section Q. December 29, 30 and 31. Headquarters, Hotel Winton; meeting place, School of Applied Social Science, Western Reserve University, 2069 Adelbert Road.

† Phi Delta Kappa Fraternity. Meets with Section Q. *President*, Shelton Phelps; *secretary*, Paul M. Cook, 1180 East 63rd St., Chicago, Ill.

X. Organizations related to the American Association as a whole.

* American Nature-Study Society. December 30 and 31 and January 1. Headquarters, Hotel Hollenden; meeting place, Room 49, Main Building, Case School of Applied Science. *President*, Bertha Chapman Cady; *secretary*, Ellen Eddy Shaw, Brooklyn Botanic Garden, Brooklyn, N. Y.; *council representatives*, J. Andrew Drushel.

** Society of Sigma Xi. December 30. Meeting place, Room 34, Main Building, Western Reserve University. *President*, George W. Stewart; *secretary*, Edward Ellery, Union College, Schenectady, N. Y.; *council representatives*, Edward Ellery and George W. Stewart.

** American Association of University Professors. December 27 and 29. Headquarters, Hotel Statler; meeting place, Room 27, Main Building, Western Reserve University. *President*, W. B. Munro; *executive secretary*, Joseph Mayer, 26 Jackson Place, Washington, D. C.; *council representatives*, Henry Crew and S. A. Mitchell.

† Gamma Alpha Graduate Scientific Fraternity. December 30. Meeting place, Room 29, Main Building, Western Reserve University: *President*, C. C. Murdock;

secretary, Rodney W. Babcock, Kansas State Agricultural College, Manhattan, Kans.

Sigma Delta Epsilon Graduate Women's Scientific Fraternity. December 30 and 31. *President*, Helen Jean Brown; *secretary*, Mary Dover, University of Missouri, Columbia, Mo.

THE AMERICAN ASSOCIATION PRESS SERVICE AT THE CLEVELAND MEETING

(By Austin H. Clark)

The Press Service of the American Association for the Advancement of Science, which has developed from the earlier news service, furnishes to the public, by means of the press, readable and timely accounts of scientific news. It brings scientific workers and newspaper writers together for their mutual aid and for the dissemination of science news. For the Cleveland meeting releases for the press will be prepared beforehand, from manuscripts and abstracts received from those who are to present papers or give addresses at the meeting. All who are to present papers at Cleveland are asked to send, as soon as possible, duplicate copies of each of their manuscripts, to the A. A. A. S. Press Service (A. A. A. S. P. S.), Smithsonian Institution Building, Washington, D. C. *A single copy will not suffice and both copies are to be sent to the same address.* Each manuscript should bear, at the top of the first page, the name of the organization before which the paper is to be presented, with information as to the date of presentation as nearly as that may be stated.

Whenever a paper for this or any other scientific meeting is being typed it will be advantageous to all concerned, including the public, if several clear carbon copies are made; such manifolding is readily accomplished and results in copies enough so that two can be sent at once to the association. Other copies should be sent to the secretaries of the organization at whose sessions the papers are to be given. The manuscripts sent to the association are not for publication as such. They are used by newspaper writers in the preparation of science news. No news story is released before the date on which the paper is presented at the meeting. The Press Service supplies the representatives of the press with the material received from the authors, the date of release being marked on each sheet. It sometimes furnishes such additional information as may be available and it aids press representatives to secure interviews with authors when such interviews are requested.

All manuscripts for use in connection with the Cleveland meeting should reach the Washington office by December 20. Manuscripts that arrive later may not receive attention. The best science stories are written long before the meeting opens, when the writ-

ers may have time for consultation and study in their preparation. It is best to have manuscripts in the hands of the Press Service before December 1. If full manuscripts can not be sent, then authors of papers and addresses for this meeting should send two copies of an adequate abstract of each paper.

Both manuscripts and abstracts should be written in the simplest possible language, so as to be readily understood by any educated person with no presupposed knowledge of the subject treated. Especially should the broader aspects of the subject be presented and its possible bearing on work in other lines and on thought in general.

Until the date of release all authors' manuscripts are regarded as strictly confidential communications, accessible only to accredited representatives of the press and to the members of the association's committee on prize award. There need be no hesitation about sending accounts of new and unpublished work. Authors may themselves send additional copies to newspaper representatives or to the news-gathering agencies, but articles based on such copies may not always be used under the sponsorship of the American Association's Press Service. In any event, two copies are needed by the Press Service.

The director of the Press Service, Austin H. Clark, is ready at all times to answer questions regarding the work of the service and to aid authors and press writers as far as possible. But it must be remembered that Mr. Clark is apt to be pressed for time in the last ten days before a meeting opens. In that period it is difficult for him to do justice to all communications.

The press is now by far the most important medium for the dissemination of scientific knowledge among the people. It is consequently a duty of science workers to do their part, to the end that their findings and ideas may be clearly set before the public. Prepare readable manuscripts and send them early and in duplicate.

THE AMERICAN ASSOCIATION PRIZE

The eighth annual award of the American Association prize, of one thousand dollars, will be made to the author of a paper presented at the Cleveland meeting. Through the generosity of an anonymous member seven of these prizes have thus far been awarded. The prize is awarded each year to the author of a noteworthy paper presented at the annual meeting. It is not necessary that the author be a member of the association. All papers appearing in the General Program are automatically eligible, excepting invited papers and presidential and vice-presidential addresses, which are not eligible. There

is to be no open competition and no submitting of papers for the prize. It is supposed, however, that manuscripts of papers that may possibly be considered by the committee on prize award will all be in the hands of the Press Service, through the arrangements described above. No special action should be taken by authors who hope to be considered in this connection. The secretary in charge of each scientific program will be expected to present one or more nominations for consideration by the committee and the committee is expected to make selection from the nominations thus submitted. Nominations are to be in writing, signed by the secretary who sends them, and they are to be addressed to the committee on award, care of Sam Woodley, *executive assistant*, at the registration offices, or else they may be sent to Mr. Woodley in the Statler Hotel. Secretaries may examine the manuscripts that have been received by the Press Service, which will have offices near the registration desks. In making the award no attempt will be made to select the "best" paper presented, for useful comparisons are not possible in different fields of science; the intention is simply that the prize shall be awarded to the author of some notable contribution presented at Cleveland. Previously published work may be considered when pertinent. The donor of the prize desires to aid younger authors by this means rather than to honor older men. The prize is not to be awarded in the same field of science for two consecutive years. The permanent secretary and the other general officers of the association have nothing at all to do with the award, nor can they be in position to give out any information concerning the nominations until after the award has been officially announced. The proceedings of the committee on prize award are to be strictly confidential.

The rules by which the award will be made and announced have been modified and the announcement of the prize winner will not be made at the close of the meeting, as has been done heretofore. According to action taken by the executive committee at its last spring meeting, the award is to be first announced in connection with the meeting following the one at which the paper appeared on the program, and the subject of the winning paper is to be specially presented in a public lecture at the later meeting. (SCIENCE for June 6, 1930, page 588, paragraph 10.) Further details are to be decided upon by the council.

A list of the names of those to whom the association prize has been awarded is shown below, together with the topics dealt with in the winning papers.

- (1) The Cincinnati award, January, 1924. L. E. Dickson, for contributions to the theory of numbers.

- (2) The Washington award, January, 1925. Divided equally between Dr. Edwin P. Hubble, for contributions on spiral nebulae, and Dr. L. R. Cleveland, for contributions on the physiology of termites and their intestinal protozoa.
- (3) The Kansas City award, January, 1926. Dr. Dayton C. Miller, for contributions on the ether-drift experiment.
- (4) The Philadelphia award, January, 1927. Dr. George D. Birkhoff, for mathematical criticism of some physical theories.
- (5) The Nashville award, January, 1928. H. J. Muller, for contributions on the influence of X-rays on genes and chromosomes.
- (6) The New York award, January, 1929. Oliver Kamm, for contributions on the hormones of the pituitary gland.
- (7) The Des Moines award, January, 1930. A. J. Dempster, for contributions on the reflection of protons from a calcite crystal.

TRANSPORTATION TO AND FROM CLEVELAND

Reduced railway rates, by the certificate plan, have been granted for this meeting by the railway passenger associations of the United States and Canada, whose courtesy and public spirit will be greatly appreciated. The round-trip fare for a person attending the meeting is to be one and one half times the regular one-way fare.

Tickets to Cleveland are to be purchased within time limits as follows: December 25 to 31, inclusive, for the following lines: Canadian Eastern lines, Canadian Western lines, Central lines, New England lines, Southeastern lines and Trunk lines. For the Western and Transcontinental lines the inclusive dates are December 22 to 28 from California; December 23 to 29 from Arizona, British Columbia, Nevada, Idaho, Montana, Utah, Washington and Oregon (except *via* California); December 21 to 27 from Oregon (*via* California); December 24 to 30 from New Mexico, Wyoming and Colorado (except Julesburg); December 25 to 31 from Julesburg, Colorado, and from Illinois, Iowa, Kansas, Manitoba, Minnesota, Missouri, Nebraska, northern Michigan, North Dakota, South Dakota and Wisconsin. For the Southwestern lines the inclusive dates are December 24 to 30 from Oklahoma and Texas and December 25 to 31 from Arkansas, Kansas, Louisiana and Missouri; also from Memphis, Tennessee, and Natchez, Mississippi. The following Southwestern lines do not offer the reduced excursion fares: Arkansas and Louisiana-Missouri Railway, Fort Smith and Western Railroad, Grayson, Nashville and Ashdown Railroad, Kansas, Oklahoma and Gulf Railway, Mississippi River and Bonne Terre Railway and National Railways of Mexico.

Persons residing in the regions of reduced rates (almost all the United States and Canada) should each purchase a first-class, full-fare, one-way, through ticket to Cleveland, being sure to secure a certificate on "Standard Certificate Form," reading for the Cleveland meeting of the "American Association for the Advancement of Science and Associated Societies." A receipt is not required and will not be useful.

Persons residing outside the regions of reduced rates should each purchase a round-trip ticket to the nearest station issuing through tickets to Cleveland and situated within the region of reduced rates. On arrival at that station a one-way ticket to Cleveland and a certificate, as directed in the preceding paragraph, should be secured.

Every one should register immediately upon arrival at Cleveland, at the registration offices for the meeting, in the Gymnasium, Western Reserve University. Be sure to fill in all blanks on the registration card and leave the card at the registration desk, where you will receive a numbered identification card, which will be receipted for the registration fee paid. (See Registration, below.) Then leave your railway certificate at the validation desk, being sure that the identification card (which you keep) is there marked to show that you have deposited a certificate. Your certificate will subsequently be endorsed by the association and then validated by the agent of the transportation companies. Call for it later at the validation desk, where you left it, presenting your identification card.

Unvalidated certificates will not be honored for the purchase of return tickets and unendorsed certificates can not be validated. Registration is therefore necessary in order to have a railway certificate validated. Each person registering is entitled to the validation of his own certificate.

For the return trip, railway agents at Cleveland will honor any properly endorsed and validated certificate if presented at least thirty minutes before the scheduled time of departure of the train for which it is to be used. Each person presenting an endorsed and validated certificate may purchase a continuous-passage, one-way, return ticket for one half of the regular fare, by the same route as that followed on the trip to Cleveland. Certificates may be validated from December 29, 1930, to January 3, 1931. The last date on which return tickets may be purchased is January 7.

Some trouble and delay has been experienced at past meetings in securing sleeping-car accommodations for the trip home. Delay may be avoided if reservations can be made at the railway station immediately upon arrival at Cleveland, before going to hotels or

meeting places or to the registration offices. It is often convenient to give the validated certificate to the porter of your hotel, with proper instructions for purchasing return ticket and sleeping-car accommodations. Arrangements for railway reservations may also be made at a special desk in the registration room.

TRANSPORTATION IN CLEVELAND

To reach the four headquarters hotels from the new Union Passenger Terminal, on the Public Square, visitors may find the following notes helpful.

Hotel Cleveland, under the same roof as the Passenger Terminal.

Hotel Hollenden, across Public Square to Superior Avenue, east on Superior Avenue to East 6th Street.

Hotel Winton, across Public Square to Euclid Avenue, east on Euclid Avenue to East 12th Street.

Hotel Statler, across Public Square to Euclid Avenue, east on Euclid Avenue to East 12th Street.

Most of the other hotels are reached by any east-bound street car marked "Euclid." Ask conductor for directions.

To reach the Western Reserve University and the Case School of Applied Science, eastbound street cars marked "East Cleveland," "Windermere," "Hayden—E. 140th," or "Euclid Village." Leave car at Adelbert Road.

The fare on street cars is eight cents, seven tickets for fifty cents. Taxicab rates are five cents per one third mile.

HOTEL ACCOMMODATIONS

The Hotel Statler is to be general headquarters for the American Association, and the headquarters hotels for many of the special societies are named in the list of societies on an earlier page of this announcement. Requests for room reservations should be sent to the hotels.

Those who plan to attend the Cleveland meeting should engage rooms at once. Whether the room desired is to be occupied by one or by two persons should be specified, also the price which the applicant wishes to pay and the date on which the room is to be occupied. If the sort of room requested is not available for the given date the hotel management will refer the request to the Cleveland Convention Board, which will tentatively assign a suitable room in another hotel, informing the applicant by letter. If the applicant does not wish to accept the assignment thus given he should inform the Convention Board, which will do its best to comply with his wishes. All the rooms in the hotel named as headquarters are equipped with baths and the daily charge for a single room is \$3.00 and up. For double rooms the daily charges

are: Hotel Cleveland, \$5.00 and up; Hotel Hollenden, \$6.00 and up; Hotel Statler, \$4.50 and up; Hotel Winton, \$4.50 and up.

An extensive list of Cleveland hotels has been prepared by the permanent secretary's office, with the assistance of the Cleveland Chamber of Commerce, and a copy of this may be had on request addressed to the American Association for the Advancement of Science, Smithsonian Institution Building, Washington, D. C. The list shows the hotel locations and their daily prices for single and double rooms, with and without bath. Those who desire inexpensive rooms should write at once for a copy of the list. Prices for single rooms generally range from \$2.00 or \$2.50 upward, for double rooms from \$3.00 upward.

REGISTRATION AT THE CLEVELAND MEETING

The registration offices for the meeting will be in the Gymnasium of Western Reserve University, as has been said, and they will be open from 9 to 6 daily throughout the week of the meeting. Registration will be necessary in order to secure the official identification card, the official badge and the general program and in order that railway certificates for the association meeting may be endorsed. All who attend any of the sessions arranged through the A. A. A. S. should register promptly, whether they are members of the association or not, using official registration cards that will be provided.

The registration fee will be two dollars, but life members and paid-up annual members of the American Association for the Advancement of Science may register by paying only one dollar. Associates for this meeting may register without paying any registration fee if they show their associateship cards. Foreign associates may show either their cards or their official invitations, received from the permanent secretary. The registration fees will be applied to meet some of the costs of the meeting.

Annual members who are in arrears for association dues may pay their arrearages at the registration offices before they register or at the same time. They may then register with payment of the reduced registration fee. Non-members may join the association or may become associates for this meeting by making the proper payments, thus securing the advantage of the reduced registration fee.

To register, fill in the blanks on a registration card and present the card at the registration desk, paying the proper registration fee. The registration clerk will keep the card and will return to you a numbered identification card, which will entitle you to the privileges of the meeting, including the official badge and a copy of the general program. If you have a rail-

way certificate for validation, leave it at the validation desk, where your identification card will be marked to show that a certificate has been left. (See above, under "Transportation to and from Cleveland.") Delegates from institutions and organizations, and all personally invited foreign associates are specially requested to register as such, noting on their registration cards their exact status in this particular.

MEMBERSHIP AND ASSOCIATESHIP IN THE ASSOCIATION

All members of the association are asked to secure new members or to send to the permanent secretary's office in Washington before December 15 names and addresses of persons who might be interested in joining the association. This request is effective throughout the year, but it is specially desirable that a large number of new members be enrolled before the opening of the meeting.

Copies of a booklet on "The Organization and Work of the American Association," as well as membership application cards and sample copies of the journals, may be secured at any time from the permanent secretary's office. Membership in the association includes a subscription to the weekly journal *SCIENCE*, or the *Scientific Monthly*, for the calendar year beginning at the close of the annual meeting. The journal alone is worth more than the annual membership dues. Annual members of the association may have both *SCIENCE* and the *Scientific Monthly* by paying \$3.00 in addition to the annual dues (\$8.00 in all), if the additional payment accompanies the remittance of annual dues. Annual members of the association may also subscribe for the *Science News-Letter* at the specially reduced price of \$3.00 per year, if the additional remittances accompany their payment of dues in each case. Life members may receive one or both of the extra journals by paying \$3.00 for each subscription.

New members of the association regularly pay an entrance fee of \$5.00, but this year that fee is remitted to members of any associated organizations, including the affiliated state academies. Those who take advantage of this privilege and join at the Cleveland meeting without paying the entrance fee should fill in the blanks on a blue membership application card and present card and dues for 1930-31 (\$5.00) when they register. All who attend the Cleveland meeting are asked to join the American Association when they register, unless they are already enrolled.

Those who are not members of the American Association and who do not wish to join at this time are invited to become associates for this meeting. The associate fee is \$5.00. Associates have all the privileges of the meeting, except voting, and they will

receive the general reports of the meeting when these are published about February 1. They are to register without paying any registration fee. Associate fees will be used to help defray the costs of the meeting.

FOREIGN ASSOCIATES

Visitors from outside of the United States and Canada who are not members of the association may be invited to the meeting as foreign associates. Members of the association may recommend to the permanent secretary persons who should receive official invitations, giving reasons. Such recommendations should arrive in the permanent secretary's office in Washington before December 20, and the present address, as well as the home address, of the recommended person should be given in each instance. Eligibility to this honor is about the same as eligibility to fellowship in the association.

INFORMATION SERVICE, MAIL, EXPRESS, TELEGRAMS, ETC.

Those in attendance at the Cleveland meeting may obtain information of all sorts by applying at the information desk in the registration offices. Attention is called, however, to the visible directory of those in attendance, from which may be obtained names and both home and Cleveland addresses of those who have registered.

Persons attending the meeting may have mail, etc., addressed to them in care of the American Association for the Advancement of Science, registration office, Gymnasium, Western Reserve University, Cleveland, Ohio. They should inspect the personal bulletin every day, which will be conveniently located in the vicinity of the registration desks. If a person's name appears on this bulletin he should inquire at the proper desk for mail, etc. Uncalled-for telegrams will be sent to hotels each afternoon when the registration offices close, unless the person addressed has failed to register and give his hotel address. Unclaimed mail, etc., will be mailed to home addresses after the close of the meeting.

BUSINESS SESSIONS OF THE AMERICAN ASSOCIATION AT CLEVELAND

The executive committee of the council is to meet at 10 o'clock on Monday, December 29, in the Statler Hotel, and the council is to hold its first Cleveland session at 2 o'clock on the afternoon of the same day, in the council room (Room 3, Main Building, Western Reserve University). This council session is to be followed by the Cleveland session of the Academy Conference. Unless otherwise decided, the council will meet at 9 on Tuesday, Wednesday, Thursday and Friday in the council room, and the executive com-

mittee will meet in the council room at 10 on the same days. The election of association officers for 1931 is to occur at the council session Wednesday or Thursday morning, as the council may decide.

Business to come before the council at Cleveland is to be referred to the executive committee first, and memoranda concerning such business should be in the Washington office by December 20. Communications that arrive late, especially those coming to the permanent secretary after the opening of the meeting, may fail to receive consideration, for the week of the meeting is a very busy one for all officers of the association.

THE SECRETARIES' CONFERENCE AND THE ACADEMY CONFERENCE

The Secretaries' Conference, a special committee of the American Association, plans to hold its annual dinner and session at Cleveland, time and place to be announced later. The secretary of this conference is Dr. Harley J. Van Cleave, secretary of the American Microscopical Society, who has charge of the program. The chairman is Dr. Philip Fox, secretary of Section D. The conference consists of the secretaries of the association sections, the secretaries of the associated societies and the members of the executive committee of the association.

The Academy Conference of the American Association is planning to hold its Cleveland session at the close of the first council session, on Monday afternoon, December 29. This conference consists of the council representatives of the affiliated academies of science and three representatives of the association. The secretary of the conference this year is Dr. Chancey Juday, of the Wisconsin Academy, who has charge of the program. The chairman is Dr. D. W. Morehouse, of the Iowa Academy.

SCIENTIFIC SESSIONS OF SECTIONS AND SOCIETIES AT CLEVELAND

Nearly all fields of science will be represented in the sessions of the sections and their related societies at the eighty-seventh meeting of the American Association. There will be many joint sessions of two or more organizations and many symposia of invited papers on timely topics, as well as a large number of society dinners, luncheons and smokers. A great many sessions will be devoted to the reading of technical contributions. The addresses of the retiring vice-presidents of the association and those of the presidents of the special societies will each be important in indicating the present status and the outlook in each of the several branches of science. It is, of course, impossible to present the numerous programs of the meeting in this announcement, for

which the reader must await the appearance of the society programs and the general program. The latter will be printed in the last two weeks before Christmas, edited for the permanent secretary's office by the program editor, Dr. Sam F. Trelease, of Columbia University. As has been said, the general program will be available at 9 o'clock, December 29, at the registration offices for the meeting, in the Gymnasium of Western Reserve University, and copies will be mailed promptly to those who are not going to attend the meeting, if they send in their requests early.

The following pages are devoted to preliminary notes on the special programs of the scientific sessions at Cleveland. These notes have been compiled by the permanent secretary from accounts furnished by the several secretaries of societies and sections, to whom we are greatly indebted for the material presented here. It is, of course, to be remembered that all statements are of a preliminary nature.

These notes on the plans of the many organizations that will take part in the meeting at Cleveland are arranged under headings that correspond to the sections of the American Association. Generally each of the associated and invited societies is related primarily to a single association section, but in some instances the societies can be properly classified only by reference to two sections or to the association as a whole. In connection with these notes see the list of organizations planning to hold sessions at the Cleveland meeting, in an earlier part of this announcement, where the names of the society officers and the dates of the society meetings are shown, as well as their hotel headquarters and most of the places for their meetings.

MATHEMATICS.—On Monday afternoon, December 29, there will be a joint meeting of the American Mathematical Society, the Statistical Association of America and Section A. Professor G. C. Evans, of Rice Institute, will speak on "Simple Types of Economic Crises and Cycles"; Professor Ragnar Frisch, of Yale University, on "A Method of Decomposing an Empirical Series into its Cyclical and Progressive Components"; Professor Harold Hotelling, of Stanford University, on "Recent Improvements in Statistical Inference." On Tuesday afternoon Professor G. D. Birkhoff, of Harvard University, will deliver an address on "Poincaré's Last Geometric Theorem, its Generalizations and Dynamical Applications"; this address is given at the request of the American Mathematical Society. Later, on the same afternoon, the eighth annual Josiah Willard Gibbs lecture, under the auspices of the American Mathematical Society and the American Association, will be delivered by Professor Edwin B. Wilson, of the Harvard School of

Public Health. On Wednesday afternoon there will be a joint meeting of the American Mathematical Society, the Mathematical Association of America and Section A. At this time the retiring vice-president for Section A, Professor E. T. Bell, of the California Institute of Technology, will deliver an address on the subject, "Mathematics and Speculation." A second address, entitled "Recent Developments in Abstract Algebra," will be given by Professor Oystein Ore, of Yale University, at the joint invitation of the American Mathematical Society and the Mathematical Association of America. There will also be sessions of the American Mathematical Society for the presentation of research contributions.

The Mathematical Association of America will hold sessions on Thursday morning and afternoon with a program of invited speakers, among these being Professor B. F. Finkel, of Drury College, on "The Early History of the *American Mathematical Monthly*"; Professor Tibor Rado, of Ohio State University, on "Mathematics in Hungary"; Professor C. F. Roos, of Cornell University, on "Theoretical and Statistical Investigations Concerning the Interrelations of Demands, Cost of Production and Profit"; and Professor J. R. Musselman, of Western Reserve University, on "The Equilateral Hyperbola." An informal dinner for the mathematics group is scheduled for Wednesday evening. A joint meeting of mathematicians and physicists is also projected, but definite arrangements have not yet been made.

PHYSICS.—Section B will hold joint meetings with the American Physical Society and with the American Meteorological Society. The retiring vice-president, Professor C. E. Mendenhall, will give an address on "Recent Developments in Photoelectricity." There will be a symposium on acoustics. The greater part of the program of the joint meetings will consist of the regular papers contributed by members of the two affiliated societies.

CHEMISTRY.—Section C plans to hold a session on Tuesday, December 30, in the Morley Chemical Laboratory, Western Reserve University. The program is being arranged by the Cleveland Section of the American Chemical Society.

ASTRONOMY.—Cleveland offers much of interest to astronomers. The mountings of many of the world's greatest telescopes were designed and built by Warner and Swasey, of Cleveland. This firm has been a pace-maker in instrument construction, combining in their designs facility of operation and precision. The original Michelson and Morley experiments on ether-drift were made in the laboratory of the Case School of Applied Science. Here also Professor D. C. Miller is continuing observations in this fundamental experi-

ment. The Municipal Observatory is a third item to attract the attention of astronomers.

Sessions for the presentation of papers in astronomy will be held in room 69, Main Building, Case School of Applied Science, on Tuesday, at 10 and 2 o'clock. There will be a joint session of Section D with Section L and the History of Science Society, in commemoration of the tricentenary of Johannes Kepler. On Wednesday afternoon Dr. Harlow Shapley, of Harvard University, retiring vice-president for Section D, will give an address on "Galactic Explorations."

GEOLOGY AND GEOGRAPHY.—Section E will hold sessions for the reading of papers on Wednesday, Thursday and Friday. On Thursday afternoon the retiring vice-president for the section, Dean George F. Kay, of the University of Iowa, will deliver an address on "The Classification and Duration of the Pleistocene Period." A dinner for geologists and geographers is being arranged for either Thursday or Friday evening. The scientific sessions will be so arranged as to permit the attendance of those who have been in Toronto earlier in the week for the meeting of the Geological Society of America at that place.

ZOOLOGICAL SCIENCES.—Section F will meet jointly with the American Society of Zoologists on Tuesday, Wednesday and Thursday. The section will not hold sessions of its own for the reading of papers, but a short business meeting will be held on one afternoon. A dinner for all zoologists will be held on the evening of either Tuesday or Wednesday. Dr. William A. Riley, of the University of Minnesota, the vice-president for the section, will deliver an address immediately following the zoologists' dinner, on "Some Present-day Problems in Zoological Teaching."

The Entomological Society of America will hold its twenty-fifth annual meeting on Tuesday and Wednesday, under the presidency of Dr. Edith M. Patch, of the Maine Agricultural Experiment Station. The Tuesday morning session will be devoted to business and reading of papers. The Tuesday afternoon session will include a symposium entitled, "Forest Entomology," headed by Dr. J. M. Swaine, of Canada. On Tuesday evening the annual public address of the society will be given by Professor H. J. Quayle, of the University of California, on "Observations Abroad on Subtropical Fruit Insects." Wednesday will be devoted to contributions, with a business session in the afternoon. The annual entomologists' dinner will probably be held Thursday evening.

The American Association of Economic Entomologists will hold its forty-third annual meeting from Monday to Friday. A varied and interesting program on many phases of entomological work is being

arranged. The morning and afternoon sessions on Monday will be devoted to the section of apiculture, under the chairmanship of Professor R. L. Parker, of the Kansas Agricultural College. On Tuesday the Section of Quarantine and Inspection, under the chairmanship of Professor E. N. Cory, of the University of Maryland, will hold morning and afternoon sessions. The general meeting will open on Wednesday morning, under the presidency of Professor Franklin Sherman, of Clemson College, who will deliver the annual address. Thursday and Friday will be devoted to scientific sessions. The Section of Extension Entomologists will hold a session on Thursday evening, with Professor C. R. Crosby, of Cornell University, as chairman.

The American Society of Parasitologists will hold its sixth annual meeting on Tuesday, Wednesday and Thursday. Of special interest will be a joint program on Wednesday with the American Society of Tropical Medicine, which is meeting with the association this year for the first time. The fact that frequently a majority of the papers presented at the meetings of either the American Society of Parasitologists or the American Society of Tropical Medicine have a primary interest as well for members of the other organization renders this joint meeting an event of considerable promise. On Tuesday morning there will be held the customary joint session with the American Society of Zoologists. The address of the retiring president, Dr. W. W. Cort, of the Johns Hopkins University, will be on "Recent Investigations on the Epidemiology of Ascariasis." Besides the usual sessions for the presentation of papers, there will be time allotted for demonstrations, as in previous years. The society will hold its annual business session and a luncheon.

The Wilson Ornithological Club will hold its seventeenth annual meeting on Monday and Tuesday, with morning and afternoon sessions. The annual dinner of the club will be held jointly with the Cleveland Bird Club and the Inland Bird-Banding Association.

BOTANICAL SCIENCES.—Section G will hold a joint session with the associated botanical societies on Tuesday afternoon, December 30. The program will include the following papers: "Hybridization and Inheritance in Ascomycetes," by B. O. Dodge; "Some Mycorrhiza Considered from the Viewpoint of Physiology," by Lewis Knudson; "Chromosome Structure and the Mechanism of Crossing-over," by Karl Sax; "Vegetation of the Ohio Valley," by E. N. Transeau.

The Botanical Society of America is to hold its twenty-fifth annual meeting on Tuesday, Wednesday and Thursday. Business sessions are to be held each morning at 9, followed at 10 by scientific sessions of

the five sections of the society. In the afternoons, joint sessions will be held with Section G of the American Association, the Ecological Society of America and the American Society of Naturalists. The annual dinner for all botanists will be held on Tuesday evening. At this time Dr. Margaret C. Ferguson, of Wellesley College, will deliver the retiring presidential address. The section programs of this society will be representative of their special fields and all branches of botany will be dealt with in the papers presented.

The American Phytopathological Society will meet Tuesday, Wednesday and Thursday, under the presidency of Dr. H. S. Fawcett, of the Citrus Experiment Station, University of California. A joint session with Section G will be held on Tuesday afternoon and a joint session with the Mycological Section of the Botanical Society of America will occur on Wednesday morning, the latter being devoted to a de Bary Memorial program. There will be a round table discussion Tuesday afternoon on extension work in plant pathology. The program on Tuesday morning will be made up of a series of invitation papers on subjects of general interest, which will be followed by a business session. Sessions on Wednesday afternoon, Thursday morning and Thursday afternoon will be devoted to contributions on diseases of vegetables, cereals, fruits and ornamentals, and to papers on other interesting topics. The annual dinner of the society is to occur on Tuesday; tickets should be secured before Tuesday noon, at the registration offices of the A. A. A. S. or in the lobby of the Hotel Hollenden. A program of great interest to all plant pathologists and botanists will follow the dinner.

The seventh annual meeting of the American Society of Plant Physiologists is to occur from Monday to Thursday. Sessions for the presentation of contributions and the transaction of business will be held on Monday, Wednesday and Thursday. There will be two joint sessions: one with the American Society for Horticultural Science, Tuesday morning, the other with the Botanical Society of America, Tuesday afternoon. The second award of the Stephen Hales Prize will be made at the annual dinner on Monday evening, at the Chamber of Commerce Club. Following the dinner there will be the presidential address, by Dr. H. R. Kraybill, of Purdue University, and an address by Dr. D. R. Hoagland, of the University of California.

BIOLOGICAL PROGRAMS RELATED TO BOTH ZOOLOGY AND BOTANY.—The forthcoming Cleveland convention of the American Society of Naturalists will be its forty-eighth annual meeting. The meeting will consist of two sessions on Thursday. According to recent cus-

tom, the afternoon session will be devoted to a symposium on a subject of general biological interest, held in conjunction with other biological societies. The general subject for this year is "The Future of Man in the Light of His Past." Among the speakers will be Dr. A. V. Kidder (Carnegie Institution) and Dr. E. M. East (Harvard). The report and recommendations of the special committee on policy, appointed at Des Moines last winter, will be presented and discussed, either at a business session following the afternoon symposium or at the annual dinner. The place and time of the dinner are to be announced later. Dinner tickets may be had from Professor J. Paul Visscher, of Western Reserve University, or at the general registration offices of the A. A. A. S.

The Ecological Society of America is to meet on Tuesday, Wednesday and Thursday. Two joint sessions with other organizations are planned, with the American Society of Zoologists on Wednesday morning and with the Botanical Society of America on Wednesday afternoon. Symposia or less formal groups of papers and discussions are planned on the following subjects: "Crop Ecology," in charge of President Weaver; "Plant and Animal Interrelations," in charge of Dr. H. C. Cowles (University of Chicago); "Environmental Units and Their Terminology," in charge of Dr. W. E. Allen (Scripps Institution). Other sessions will be devoted to papers of general ecological interest and to business. There will be an informal dinner.

The American Microscopical Society will hold its annual business meeting and election of officers on Friday afternoon, January 2, at 4 o'clock.

The Phi Sigma Biological Research Society will hold its annual convention and meetings on Wednesday and Thursday. The morning and afternoon sessions of the first day will be taken up with business. The second day will be devoted to the reading of research contributions. A banquet will be held for the delegates.

The Genetics Sections of the American Society of Zoologists and the Botanical Society of America will hold regular sessions for the reading of papers on Tuesday, Wednesday, Thursday and Friday mornings. There will be a short business session for the election of officers and to receive the report of a committee chosen at the Des Moines meeting to study the organization of geneticists. During the afternoons there will be informal laboratory demonstrations and exhibits. The Genetics Sections will meet Monday morning with the Geneticists Interested in Agriculture, in a symposium on "Inbreeding and Its Application to Improvement in Plants and Animals." (See under Agriculture, below.)

ANTHROPOLOGY.—The meetings of Section H will occur on Tuesday and Wednesday. The address of the retiring vice-president for the section will be given by Dr. A. V. Kidder at the anthropologists' dinner, details of which will be announced later. There will be joint sessions with the American Anthropological Association and the American Folk-Lore Society, at which papers of wide interest will be discussed. As is the custom when the various anthropological groups meet with the American Association, the program of Section H will be limited largely to papers and demonstrations relating to physical anthropology. Work in this latter field has been especially fostered at Cleveland and the present meeting promises to be one of unusual interest. The American Association of Physical Anthropologists will also hold sessions at Cleveland this year.

PSYCHOLOGY.—Section I will hold sessions on Friday, January 2. Professor Madison Bentley, of Cornell University, retiring vice-president for the section, will give the vice-presidential address in the afternoon. His title will be "Psychology's Family Relations among the Sciences." The remainder of the sessions will be devoted to contributions.

SOCIAL AND ECONOMIC SCIENCES.—Section K will hold no sessions by itself. A joint session with Section A (Mathematics), the American Mathematical Society and the American Statistical Association will be held Monday afternoon, the program being devoted to mathematical papers on statistics and economics. The invited speakers for this session are Professor G. C. Evans (Rice Institute), Professor Ragnar Frisch (Yale University) and Professor Harold Hotelling (Stanford University). Professor Evans will give a paper entitled "Simple Types of Economic Crises and Cycles," and Professor Hotelling will speak on "Recent Improvements in Statistical Inference." Professor Frisch's subject is to be announced.

Although the permanent secretary has little detailed information concerning the plans of the independent scientific societies of the social-economic group that are to meet in Cleveland in convocation week—since these societies have preferred to manage their own arrangements and their secretaries have consequently not kept the Washington office informed as preparations have proceeded—yet it is certain that the sessions of this group of societies will constitute a very important part of the unusual attractions of the Cleveland meeting. It is very unusual to have the social and economic sciences so strongly represented along with the natural and exact sciences, and the association is highly gratified by the presence of these important societies this year. The council has repeat-

edly expressed the hope that these two main groups of science workers may come into closer contact, for mutual benefit and appreciation and for the advancement of science as a whole.

The Metric Association will hold sessions at the Hotel Statler on Monday morning and afternoon, celebrating the fourteenth anniversary of the founding of the organization. The morning session will be devoted to problems of standardization in industry. There will be the usual Weights and Measures luncheon. The afternoon session will be devoted to legislation, education, publicity and business. The annual Metric dinner, at the Hotel Statler, will occur Monday.

HISTORICAL AND PHILOLOGICAL SCIENCES.—The History of Science Society will hold sessions on Wednesday and Thursday, in conjunction with the committee on the promotion of Chinese studies, of the American Council of Learned Societies. The first day will be devoted to the history of science in China, with papers on ephedrin, alchemy, tropical medicine, horticulture, agriculture, mathematics and the Chinese scientific method. A joint session with Sections D and L will be devoted to papers commemorating the tricentenary of the death of Johannes Kepler. A session is being planned for papers on the development of laboratories in the universities of the Middle Ages.

ENGINEERING.—Section M will hold sessions on Tuesday morning and afternoon and on Wednesday morning. The Tuesday sessions, arranged by a local committee, are to be devoted to recent developments in telephony, mechanics of the telescope, sewage and water problems of the Great Lakes region, and recent metallurgical developments. At the Wednesday session will be presented the retiring vice-presidential address of Professor H. F. Moore, of the University of Illinois, who will speak on "Engineering Culture." The education of engineers after leaving college will be the topic of another address.

The Cleveland section of the Institute of Radio Engineers is planning to hold sessions in convocation week, but further information concerning these important programs has not been received.

MEDICAL SCIENCES.—It is expected that Section N will hold a session of invited papers on medical topics of general interest. The American Society of Tropical Medicine has intimated that it will hold sessions at Cleveland, but definite information is still lacking.

AGRICULTURE.—Section O will hold morning and afternoon sessions on Tuesday, with the American Society of Agronomy, in a symposium on "Nitrogen Relationships in Soils," arranged by Professor R. M. Salter, of Ohio State University. The invitation papers will deal with the several important aspects

of the nitrogen problem. A joint dinner with the American Society of Agronomy and other associated societies will be held on Tuesday evening, at which time Professor M. F. Miller, of the University of Missouri, will deliver the address of the retiring vice-president for Section O.

The American Society for Horticultural Science will hold its twenty-seventh annual meeting on Monday, Tuesday and Wednesday. The annual horticulturists' dinner will occur on Tuesday evening, after which the address of the retiring president will be given by A. T. Erwin, of Iowa State College. There will be a joint session with the American Society of Plant Physiologists on Tuesday forenoon. A session will be devoted to floriculture and ornamental horticulture.

The Association of Official Seed Analysts is to meet on Wednesday, Thursday and Friday. The presidential address will be given Wednesday, by President A. L. Stone, of the University of Wisconsin. Thursday will be devoted to a symposium on variations and tolerances, at which the discussion will be led by W. H. Wright, of the Canadian Department of Agriculture. Among the speakers at this symposium will be Edgar Brown (U. S. Department of Agriculture), H. R. Kraybill (Purdue University) and M. T. Munn (New York Agricultural Experiment Station, Geneva). The annual dinner of this association will be held on Thursday evening. There will be the usual business session, with committee reports and a number of papers of general interest.

The Potato Association of America plans to hold sessions on Tuesday and Wednesday, with papers on many phases of potato culture, but the permanent secretary has no further information in this connection.

The Geneticists Interested in Agriculture will meet on Monday morning with the Genetics Sections of the Zoological and Botanical Societies. This session will be devoted to a symposium on "Inbreeding and Its Application to Improvement in Plants and Animals." The speakers will be F. A. Krantz (University of Minnesota) and W. F. Dove (University of Maine). Dr. Krantz will consider the subject with particular reference to improvement in potatoes and Dr. Dove from the standpoint of poultry breeding. On Monday afternoon there will be a joint session with the American Society of Agronomy, at which a program on "Inbreeding with Particular Reference to Maize" will be presented. The speakers will be R. J. Garber (West Virginia University) and F. D. Richey (U. S. Bureau of Plant Industry).

EDUCATION.—Six sessions of Section Q are planned for Monday, Tuesday and Wednesday. A joint din-

ner of the section with the Societies of Phi Delta Kappa and Kappa Delta Pi is planned for Tuesday evening. A brief program will follow the dinner, devoted to studies in administrative and supervisory research. At the Tuesday afternoon session the retiring vice-president for Section Q, Dr. Frank N. Freeman (of the University of Chicago), will present an address. The topics for the other sessions are: "Research in Elementary Education," Monday morning; "Research in Secondary and Collegiate Education," Monday afternoon; "Research in Social Studies and other Problems of Character Training," Tuesday morning; "Investigations in the Teaching of Science," Wednesday morning.

PROGRAMS RELATED TO SCIENCE IN GENERAL.—The Society of the Sigma Xi is to hold on Tuesday afternoon a business meeting beginning at 4 o'clock. The annual dinner will occur Tuesday at 6:30 and the

ninth annual Sigma Xi lecture will be given at the general session Tuesday evening, by Dr. C. E. Kenneth Mees, director of research of the Eastman Kodak Company. Tickets for the dinner may be secured, before Tuesday noon, at the general registration offices in the gymnasium of Western Reserve University. The American Nature-Study Society plans to hold sessions on nature-study problems of various kinds, especially nature education. A dinner of the society is planned. The Gamma Alpha Scientific Fraternity will hold its council meeting on Tuesday afternoon and a breakfast on Wednesday morning. A proposed revision of the constitution will be considered. Sigma Delta Epsilon, Graduate Women's Scientific Organization, will have two breakfast meetings, with interesting talks. The Tuesday breakfast will be for all women visitors, while the meeting on Wednesday will be specially for members of the organization.

SCIENTIFIC EVENTS

THE BRITISH FRESHWATER BIOLOGICAL STATION

ACCORDING to an article in the *London Times* the Freshwater Biological Association of the British Empire was founded in the early part of this year with the object of securing the establishment of a freshwater laboratory to prosecute research into the problems of freshwater biology. Although the movement originated among the professional biologists of Great Britain, it has secured the support of the leading scientific societies and of a large proportion of the economic bodies interested in river pollution, freshwater fisheries, and the like.

The conference convened by the council of the association at Fishmongers' Hall on February 21 last afforded evidence of the interest displayed and showed that there is a real and widely felt need for a freshwater research station. Promises of financial support in the form of annual grants have been received from many sources. They are conditional upon the actual founding of the station as a research center. The council are now making an appeal for contributions to a fund for the establishment and initial equipment of the station, and several hundred pounds have already been promised.

It is hoped that all who are interested in fresh waters, such as public bodies responsible for water supply, medical officers of health, water and sanitary engineers, fishermen and naturalists, will realize the importance of the projected station and will be prepared to help by contributing to the fund. Contributions of any amount, large or small, will be welcomed.

The council have prepared a pamphlet giving an outline of the aims of freshwater biology in the British Isles, which includes a scheme of work and plans for the projected station. This pamphlet, as well as the report of the conference at Fishmongers' Hall, can be obtained on application to the acting secretary, Professor F. Balfour Browne, Wincombe Court, Wincombe, Somerset.

CELEBRATION OF THE TWENTY-FIFTH ANNIVERSARY OF THE THEORY OF RELATIVITY

ON November 10, the University of Colorado celebrated the twenty-fifth anniversary of the theory of relativity. It was on September 26, 1905, that Professor Einstein's first paper on relativity entitled, "Zur Elektrodynamik Bewegter Körper," appeared in the *Annalen der Physik*. As far as is known, this was the second celebration honoring the famous physicist, the first being that of the Royal Society in London some time ago.

The celebration opened with a banquet in the Memorial Union Building with places set for one hundred and seventy persons, consisting of students, faculty, townspeople and delegations from the Colorado School of Mines, Colorado State Teachers' College and the Colorado Agricultural College. At the dinner Dr. Junius F. Brown, of the department of psychology, gave reminiscences of Professor Einstein as he knew him in the seminar in Berlin last year.

After the dinner addresses were given by various members of the faculty. Dean O. C. Lester, of the Graduate School, spoke on "The Changed Outlook on

Physical Theories"; Dr. V. P. Lubovich, assistant professor of physics, spoke on "Does the Inertia of a Body Depend upon its Energy Content?"; Dr. Walter B. Veazie, of the department of philosophy, discussed "Relativity and Philosophy," and Dr. Frank E. E. Germann, professor of chemistry, spoke on "Chemistry and Relativity."

During the program, a painting of Dr. Einstein by Miss Virginia True, of the art department, was unveiled. An informal hour followed in the banquet room, where fifteen posters hanging on the walls representing "practical" applications of Einstein's theory of relativity were studied. A letter of congratulation, signed by those at the dinner, was sent to Professor Einstein.

FRANK E. E. GERMANN

JOINT MEETING AT LOS ANGELES OF THE AMERICAN PHYSICAL SOCIETY AND OF THE ACOUSTICAL SOCIETY OF AMERICA

A JOINT meeting of the American Physical Society and the Acoustical Society of America will be held on the campus of the University of California at Los Angeles on December 12 and 13. Dr. Vern O. Knudsen, associate professor of physics, is in charge of arrangements for the meeting. More than two hundred delegates from various parts of America are expected to attend.

According to preliminary plans, there will be one joint session of the two organizations. At this session it is planned that six papers will be presented, including three papers by members of each association. In addition there will be a symposium on the recording and reproducing of sound in talking moving pictures, and also a symposium on atmosphere acoustics and sound signaling. An inspection tour of the talking-picture studios is also planned for the visitors.

Professor Leonard B. Loeb, of the University of California, Pacific Coast secretary of the American Physical Society, is in charge of the arrangements for his organization. Other officers of this society include Dr. Henry G. Gale, University of Chicago, *president*; Dr. W. F. G. Swann, Bartol Research Foundation, Philadelphia, *vice-president*; Dr. W. L. Severinghaus, Columbia University, *secretary*; Dr. G. B. Pegram, Columbia University, *treasurer*, and Dr. John A. Tate, of the University of Minnesota.

Officers of the Acoustical Society of America include Dr. Harvey Fletcher, of the Bell Telephone Laboratory of New York, *president*; Dr. Vern O. Knudsen, of the University of California at Los Angeles, *vice-president*; Wallace Waterfall, of Chicago, *secretary*, and Dr. E. E. Free, of New York, *treasurer*.

SCIENTIFIC NOTES AND NEWS

THE awards of royal and other medals by the Royal Society, London, have been announced as follows: A Royal Medal to Professor O. W. Richardson, F.R.S., for his work on thermionics and spectroscopy. A Royal Medal to Professor J. E. Marr, F.R.S., for his pioneer work in the accurate zoning of the Paleozoic rocks. The Copley Medal to Sir William Bragg, K.B.E., F.R.S., for his contributions to crystallography and radioactivity. The Rumford Medal to Professor Peter Debye, of Leipzig, for his work relating to specific heats and X-ray spectroscopy. The Davy Medal to Professor R. Robinson, F.R.S., for his work on the constitution and synthesis of natural products, and for his contributions to the theory of original reactions. The Darwin Medal to Professor Johannes Schmidt, of Copenhagen, for his extended oceanographical expeditions and his genetic studies on animals and plants. The Hughes Medal to Sir C. V. Raman, F.R.S., of Calcutta, for his work on the abnormal scattering of light. The following is a list of those recommended by the president and council for election at the anniversary meeting on December 1: Sir F. Gowland Hopkins, *president*; Sir Henry Lyons, *treasurer*; Dr. H. H. Dale and Dr. F. E.

Smith, *secretaries*; Lord Rayleigh, *foreign secretary*. Other members of the council: Professor E. V. Appleton, Professor G. Barger, Professor A. E. Boycott, Professor E. P. Cathcart, Sir Alfred Ewing, Professor E. S. Goodrich, Professor G. H. Hardy, Sir Harold Hartley, Sir Thomas Lewis, Dr. W. H. Mills, Professor E. A. Milne, Dr. A. B. Rendle, Professor R. V. Southwell, Professor G. I. Taylor, Professor D. M. S. Watson and Professor W. W. Watts.

ON November 18 a tribute from Germany was brought to Mr. Thomas A. Edison by Dr. Heinrich Jebens, president of the German Association of Inventors, who came to Mr. Edison's laboratory at Menlo Park. The certificate reads: "To the great master of technical development, the benefactor of humanity and the outstanding example for the inventors of the entire world, Mr. Thomas Alva Edison, we herewith tender an honorary membership in the German Association of Inventors."

DR. ALAN GREGG has been appointed director for the medical sciences of the Rockefeller Foundation. He will occupy the position vacated by the death on February 16 of Dr. Richard M. Pearce, Jr., in whose

work he had for many years closely participated as associate director for the medical sciences. Dr. Gregg first took up his work with the Rockefeller Foundation as a field staff member of the International Health Board in 1919. For three years he was actively engaged in public health work in Brazil. In 1922 he became associate director of the division of medical education. After making extensive studies of medical education in a number of countries, which included Colombia, Mexico and Italy, he was stationed at the Paris Office of the Rockefeller Foundation, from which since 1925 he has been directing Rockefeller Foundation work in the medical sciences in Europe.

PROFESSOR JULIAN HUXLEY, of King's College, London, spoke at the centenary celebration of the Boston Society of Natural History on November 18. Other speakers were Dr. William Morton Wheeler, a trustee; Dr. Edward Wigglesworth, the director, and Dr. Thomas Barbour, director of the University Museum at Harvard, a former president.

ON the occasion of the seventy-fifth anniversary of the Zurich Polytechnic Institute, honorary doctorates were conferred on Professor Albert Einstein, of the University of Berlin, who was formerly a student and a teacher at the school, and on Professor A. E. H. Love, of the University of Oxford, in recognition of his work on natural philosophy.

DR. JAMES BARNES, professor of physics of Bryn Mawr College, has been appointed head physicist at the Benjamin Franklin Memorial and Franklin Institute Museum, now being erected at Philadelphia. Dr. Barnes will assume his new work at the conclusion of the college year.

DR. L. T. COMRIE, a graduate of New Zealand and Cambridge Universities, has been promoted to the post of superintendent of the Nautical Almanac Office, Greenwich, England.

DR. JAMES CRAWFORD WATT, formerly associate professor of anatomy in the University of Toronto, has been promoted by the board of governors of that institution and given the full rank of professor of anatomy.

DR. B. L. VAN DER WAERDEN, professor of mathematics at Groningen, has been called to the university at Leipzig.

BYRON H. THOMAS, at present director of nutritional research for the Gordon Walker Company, has been appointed professor of animal husbandry at Iowa State College as well as chief in animal chemistry and nutrition at the experiment station at Ames.

DR. MAXWELL KARSHAN has been appointed associate professor of biologic chemistry at Columbia University.

PROFESSOR C. H. HOTCHKISS, in charge of the heating and ventilating work in the School of Mechanical Engineering at Purdue University for the last five years, has tendered his resignation effective on November 15, to become editor of the *Heating and Ventilating Magazine*, the principal journal of the heating and ventilating industry. Professor Hotchkiss will be succeeded by Professor W. T. Miller, who has been connected with Purdue University for several years, after experience in industry since his graduation in 1915.

MR. R. V. WRIGHT, of New York, managing editor of *Railway Age*, has been elected president for 1931 of the American Society of Mechanical Engineers. Mr. Wright succeeds Mr. Charles Piez, of Chicago, and will be installed at the annual meeting which will be held from December 1 to 5. Vice-presidents elected on the same ballot were Dr. Harvey N. Davis, president of Stevens Institute of Technology, Mr. William A. Hanley, engineering director of Eli Lilly and Company, Indianapolis, chemists, and Thomas R. Weymouth, president of the Oklahoma Natural Gas Corporation of Tulsa.

DR. LEONHARD STEJNEGER, of the U. S. National Museum, returned to Washington on November 4 after a three months' European trip during which he attended the International Zoological Congress at Padua, Italy.

DR. G. ELLIOT SMITH, University College, London, will deliver the third Harvey Society Lecture at the New York Academy of Medicine, on Thursday evening, December 4. His subject will be "The Peking Man."

DR. WILLIAM JOHN GIES, professor of biological chemistry in the College of Physicians and Surgeons, Columbia University, will give the Founders' Day address at the Medical College of Virginia at Richmond on December 1.

THE annual Gross lecture was delivered by Dr. William H. Woglom, of the Institute of Cancer Research, Columbia University, before the Pathological Society of Philadelphia on November 13 on "Experimental Cancer."

PROFESSOR ALEXANDER SILVERMAN, head of the department of chemistry of the University of Pittsburgh, delivered an illustrated lecture on glass before the Scientific Society of New Brunswick, N. J., on November 12.

DR. HARLAN T. STETSON, director of the Perkins Observatory, Ohio Wesleyan University, lectured during the month of November on "Sun Spots and Radio," before the American Optical Society of Rochester, the Pittsfield, Massachusetts, section of the American Institute of Electrical Engineers, and at Cornell University. He also lectured before the Brooklyn Institute of Arts and Sciences on "What are the Stars?"

DR. T. A. RUSSELL, president of Willys-Overland Limited, delivered his presidential address before the Royal Canadian Institute on "The Motor Car in World Affairs" on November 1.

SIR J. H. JEANS, of Trinity College, Cambridge, delivered the Rede Lecture on November 4, his subject being "The Mysterious Universe."

THE second Henry Herbert Wills Memorial Lecture in physics was delivered in the H. H. Wills Physical Laboratory, Bristol, on October 25, by Professor J. Franck, of Göttingen. The title of the lecture was "The Relation between Spectroscopy and Chemistry."

DR. G. FRANCHINI, director of the School of Tropical Medicine, University of Bologna, Italy, recently addressed the Association of Italian Physicians in America on the work of Alphonse Laveran.

DR. LUDWIG ASCHOFF, professor of pathology in the University of Freiburg, has been invited to give a series of lectures in the principal cities of Soviet Russia.

THE annual meeting of the Federation of American Societies for Experimental Biology will be held at McGill University, Montreal, from April 8 to 11, 1931.

THE second annual meeting of the Society of Rheology will be held at Lafayette College, Easton, Pennsylvania, on Monday and Tuesday, December 29 and 30. Programs, reservations and notices in regard to the meeting may be obtained from Professor Eugene C. Bingham, chairman of the Committee on Arrangements, Lafayette College.

THE first meeting of the Central States Forestry Congress called under the auspices of the state of Indiana will be held in Indianapolis on December 3, 4 and 5. This is the first concerted attempt of this group of states to organize a general forestry congress for the promotion of forestry activities in the region.

THE development of a nationwide program of research in cooperation with American universities as a next step in the extension of the activities of the National Committee for Mental Hygiene was announced as a major objective for the near future at a luncheon

held on November 13 in New York City, in celebration of the committee's twenty-first anniversary. The effort will be made under the leadership of Dr. C. M. Hincks, medical director of the Canadian National Committee for Mental Hygiene and a vice-president of the International Committee for Mental Hygiene, who was introduced as the new general director of the organization, succeeding Dr. Frankwood E. Williams, who will retire on January 1 after serving fourteen years. At the business meeting immediately following the luncheon the following officers were re-elected: *Honorary President*, Dr. William H. Welch; *President*, Dr. Charles P. Emerson; *Vice-presidents*, President James R. Angell, The Right Reverend William Lawrence, D.D., Dr. William L. Russell and Dr. Bernard Sachs; *Treasurer*, Mr. Frederick W. Allen; *Secretary*, Mr. Clifford W. Beers.

At the Imperial Botanical Conference held on August 15 the following resolution was passed: "That an Imperial Botanical Conference take place in England in 1935, shortly before the International Botanical Congress which is to be held in that year in Holland." The following interim committee was appointed: The Director of Kew (convener); the Keeper of Botany, Natural History Museum; the professors of botany at Oxford and Cambridge; a professor of botany of the University of London (to be nominated by the chairman of the Board of Studies of the University); one representative of the Colonial Office, and one representative of the Dominion Office. It was further resolved that this committee summon a meeting of British botanists in the near future for the purpose of appointing an executive committee for the said conference.

Nature reports that a Scientific Advisory Committee on Medical Administration and Investigation has been appointed by the Secretary of State for Scotland "to assist the Department of Health for Scotland in applying the results of scientific research to the details of public health administration and in promoting such medical investigations as come within the sphere of the department or of the local authorities in Scotland." The members of the committee are: Dr. Alexander Bowman, scientific superintendent, Marine Laboratory of the Fishery Board for Scotland; Professor C. H. Browning, professor of bacteriology, University of Glasgow; Professor E. P. Cathcart, professor of physiology, University of Glasgow; Professor F. A. E. Crew, professor of animal genetics, University of Edinburgh, and director of the Animal Breeding Research Department; Sir Walter M. Fletcher, secretary to the Medical Research Council; Sir Robert Greig, secretary, Department of Agriculture for Scotland; Mr. John Jeffrey, secretary, Department of Health for

Scotland; Dr. J. Parlane Kinloch, chief medical officer, Department of Health for Scotland; Dr. A. S. M. Macgregor, medical officer of health, Glasgow; Professor T. J. Mackie, professor of bacteriology, University of Edinburgh; Professor J. J. R. Macleod, professor of physiology, University of Aberdeen; Professor Robert Muir, professor of pathology, University of Glasgow; Dr. J. B. Orr, director of the Rowett Institute for Research in Animal Nutrition, Aberdeen, and Professor W. J. Tulloch, professor of bacteriology, University of St. Andrews. Dr. Parlane Kinloch is chairman, and Mr. George Wallace, of the Department of Health for Scotland, is secretary of the committee.

A MILLION acres covered by heavy forest at the headwaters of Salmon River have been set aside as a "primitive area" by order of R. H. Rutledge, district forester. As such the tract will be kept as it was found by the pioneers, unmarred by roads or trails except as necessary for fire protection. It includes the Chamberlain Basin, the center of some of the best big game hunting in America. In it abound deer, elks, mountain sheep and goats and an occasional moose is found, while animals of prey, such as mountain lions, wolves and bears are frequently encountered.

Nature reports that a selection of the zoological and botanical specimens collected during Lord Howard de Walden's recent expedition to Uganda and the eastern Belgian Congo was exhibited at the meeting of the Trustees of the British Museum held at the Natural History Museum on July 26. The collection, which is the gift of Lord Howard de Walden to the National Collection, is one of the most important accessions received by the museum of recent years. The expedition left Fort Portal for the Semliki Valley on Feb. 17 last. Collecting was carried out within twenty miles of Lake Albert, and afterwards in a south-westerly direction to the Semliki Valley, crossing over into the Congo on Mar. 7. The route then led up the western escarpment of the Semliki Valley to Mboga and then west into the Ituri Forest. On Mar. 29 the expedition divided, one party proceeding south to Beni, the other going west to the Ituri River. Both parties came out of the Congo *via* Irumu and crossed Lake Albert into Uganda on the homeward journey during May. Lord Howard de Walden, in addition to spending some time with the expedition in the forest area, made a special trip to the Birunga Mountains lying to the northeast of Lake Kivu, with the object of photographing the eastern gorilla (*Gorilla gorilla beringeri*) and its habitat. The personnel of the expedition to the Ituri and Semliki Valleys, in addition to Lord Howard de Walden and Dr. Avery,

consisted of Mr. R. Akroyd, who as well as organizing the expedition did valuable work as a collector of the larger mammals; Capt. F. A. B. Holloway, who concentrated chiefly on invertebrates, making a large collection of butterflies and other insects, and Mr. R. W. Hayman, a member of the museum staff, who specialized on the medium-sized and small mammalia. Two white hunters accompanied the expedition as guides and supervisors of the "safari." The mammals collected number 427 specimens, including 67 monkeys, 110 bats, 71 carnivores, 23 ungulates and 147 rodents. The reptiles and amphibians collected number 65 specimens, representing 31 species in all.

THE Berlin correspondent of the *Journal* of the American Medical Association writes: "The unsatisfactory demographic situation in Germany gave rise, in January, 1930, to the appointment of a federal commission on demographic problems. The chairman, Professor Gottstein, ministerial director, retired, has given his first report on the work accomplished. The commission is divided into three groups, each of which is directed by an expert. Group 1 is studying the problem of the birth rate under the direction of Professor A. Grotjahn, of Berlin, who has declared that relief from taxation is not in itself a sufficient means of solving demographic problems. He considers preferential economic treatment of the parents a more suitable method. By voluntary limitation of the number of children in families the number of living births in recent decades has dropped from 40 to 18 per thousand. Berlin, which has the lowest record, registered only 10 living births per thousand of population. Deaths in Berlin in 1929 exceeded the births by 10,000. The commonly assigned reasons for the voluntary limitation of the number of children in Germany (unemployment and the housing situation) are by no means convincing. The decline in the birth rate during the war period will, in a few years, lead to a dearth of man power in Germany. The fact is that during the years 1933-1937 there will be approximately two million fewer competent workers. This brings the senescence of the German people near. The second group of the commission under the chairmanship of Professor H. Sellheim, gynecologist of Leipzig, will seek to improve the protection of expectant mothers and of children as yet unborn. Group 3, under the chairmanship of Professor Rott, of Berlin, will study such problems connected with the preservation of the oncoming generation as infant welfare and the elimination of the preventable diseases. With regard to the tax reforms, the following demands are made: preferential treatment of families and children in the graduation of taxes on salaries, incomes, property and legacies, together with the es-

establishment of a uniform exemption from taxation of at least 600 marks for each member of a family, with

elimination of the present maximal sum for the whole family."

DISCUSSION

"MAD ITCH" OF CATTLE

THE observations made in this note are based on an outbreak of "mad itch" in a herd of dairy cattle in Johnson County, Iowa, in 1930. The disease is a rapidly fatal one, the interval in this outbreak between the appearance of pruritus or "itch" and death ranged from 36 to 48 hours.

The source of our experimental material was the brain tissue, preserved in glycerol, of three cows. The specimens from two cows produced no effect when injected subcutaneously into rabbits. The remaining specimen was effective, and on injection produced conditions resembling "mad itch" in cattle and death in a total period of 100 hours or less. The symptoms of pruritus appeared in from 70 to 80 hours after the inoculation and death followed 12 to 24 hours later.

Not only rabbits, but guinea pigs, white rats and mice are susceptible to inoculation. A difference has been noted in the susceptibility of the rabbit and the other animals. Subcutaneous injection is regularly effective in the rabbit, and intracerebral injection in the other species. Inoculations by other routes are irregularly effective in guinea pigs, rats and mice.

We have been interested in the experimental production of "mad itch" in small laboratory animals because through them an exhaustive study will be facilitated, and the nature of the etiologic or causative agent of the disease may be determined.

It is obvious that the agent is resistant to glycerolization. This is equally true of the infected rabbit and cow brain. No ordinary bacterial organism has by methods of culture and direct microscopic examination been discovered. On the other hand, suspensions of emulsified brain of rabbits, when passed through Berkefeld filters V, N and W, and Chamberland filter L³, are all effective in inducing the experimental disease in rabbits.

The indications, therefore, are that "mad itch" in cattle is a disease communicable to laboratory rodents and its incitant is a filterpassing virus.

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THE SORTING POWER OF WIND AND WAVE

THE sorting power of streams of water—the power to sift out light or fine material from coarse or heavy

material, such as dust, sand, gravel, etc.—has long been known and much studied. The sorting power of winds and waves is also a matter of common knowledge, but perhaps the effectiveness with which this process is carried on under favorable circumstances is not quite so generally known. The thoroughness of the sifting depends upon several factors, including especially differences in the size, shape and specific gravity of the particles, and, to a lesser degree, the slope of the surface and velocity of the wind or waves.

During the past summer we found on the shores of Bear Lake, Idaho-Wyoming, immense numbers of mollusk shells, chiefly *Carinifex*, with some *Lymnaea utahensis*, *Paludetrina*, *Valvata*, *Fluminicola* and other genera. On some portions of the shore the shells had been gathered by the waves into low windrows, or, to coin a more expressive term for the particular phenomena, waverows, from one to three or four inches deep and two to five times as wide. On a fine, sandy beach at the north end of the lake we scooped four quarts of shells by double handfuls from the top of the windrows and sacked them. In the laboratory we found that the shells had been so thoroughly sifted from the surrounding sand, by the waves, that there was only about a teaspoonful of sand left after separating out all the shells. On a similar beach on the west side we scooped up two quarts of shells out of which only three tablespoonfuls of sand were obtained. South of Garden City, on gravel, our collections contained coarse pebbles, in size roughly comparable to the shells, up to about 3 per cent. On the east side of the lake not far from the southern end, on a beach composed chiefly of well-rounded gravel of about the same average size as the shells but of course much heavier in proportion to bulk, we scooped up three pints from the windrows, which yielded 20 per cent. gravel, in bulk, much more in weight.

Near Thermal, California, a little hollow in the sand was filled with *Paludetrina protea*, *P. longinqua* and *Physa*, from which the fine sand had been so completely eliminated by the wind that in a lot of about 12,000 specimens scooped up by the hands there was scarcely a trace of sand. Near Brownwood, Texas, we found a ledge of limestone composed largely of foraminifera (*Fusulina*), which were weathering out rapidly. These were gathered by the wind into little depressions in the rock, the finer débris resulting from

the weathering having been almost completely eliminated. These are just a few out of numerous instances where shells and fossils have afforded data useful in the study of the sorting power of wind and water. Incidentally, they suggest the explanation of occasional occurrences of "pockets" and "streaks" of fossils in the rocks which would otherwise be very puzzling.

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A TERRESTRIAL AMPHIPOD IN THE UNITED STATES

A TERRESTRIAL amphipod, *Talitrus alluandi*, has been found in abundance in a greenhouse in Ohio. Besides its natural habitat, which appears to be the Indo-Pacific Islands, it has also been recorded from several localities in Europe, where it apparently has been carried and has become established locally. The most recent of these reports is one by K. Stephensen in 1924 on the finding of this organism in a greenhouse in Copenhagen.

The fact that the specimens under consideration were found in large numbers in a greenhouse in Columbus, Ohio, would lend support to the idea that this form has likewise been transported to this country and has survived for more than two years in an environment which simulates tropical conditions.

The specimens, measuring from two to four and a quarter millimeters in length, were found in great abundance in a greenhouse of the Fifth Avenue Floral Company, at Columbus, Ohio, by Mr. H. Walker, of the Ohio State University, and were given to the writers by Dr. Raymond C. Osburn. Search has been made in many other greenhouses but without success. They have, however, subsequently been cultured successfully in the laboratory at Cleveland.

It is believed that this is the first record of a completely terrestrial amphipod found within the United States. *Talitrus alluandi* was described by Chevreux in 1901, in the *Mem. Soc. Zool. de France*, 14: 389-393.

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PLANT LICE PUMPING IN UNISON

THE phenomenon, "flashing of fireflies in unison," discussed on page 132 in the January 31 and on page 537 in the May 23 issues, prompts me to report some observations of the curious behavior of aphids. These insects appear to lift their bodies simultaneously in the act of feeding, sucking the sap of a host plant. Following the theory described in the second discussion mentioned above, the insect on seeing his neighbor rise for inspiration or pumping may himself rise to keep in step and thus all in a like way tend to synchronism. But apparently incidence of light is not a motive, as the writer has placed a cardboard screen around the sides of an individual feeding in proximity to many others and this individual kept in step right on with the others, and even when there was a pause all along the line he paused too, and on recommencement of the lifting or inflating of their bodies in the act of sucking again, the screened individual was found to be in step as before, although he could not see any of them. It was noted that a colony of the insects rising in unison on a branch somewhat removed from another collection rising in unison on another branch did not coincide in moment, i.e., each individual colony rose as a man, but did not rise in unison with the other colony.

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SPECIAL CORRESPONDENCE

A NATIONAL SYSTEM OF EXPERIMENTAL FORESTS AND RANGES

THE Acting Secretary of Agriculture recently approved a National Forest regulation which marks a new epoch in the forest-research work of the United States. The regulation is as follows:

The forester shall determine, define and permanently record a series of areas of national forest land to be known as experimental forests, sufficient in number and extent adequately to provide for the experimental work necessary as a basis for forest production or forest and range production in each forest region, these areas to be dedicated to and used for research; also where necessary a supplemental series of areas for range investigations to be known as experimental ranges; and a series

to be known as natural areas sufficient in number and extent adequately to illustrate or typify virgin conditions of forest or range growth in each forest or range region, to be retained in a virgin or unmodified condition for purposes of science, research and education; and a series of areas to be known as primitive areas within which will be maintained primitive conditions of environment, transportation, habitation and subsistence, with a view to conserving the value of such areas for purposes of public education and recreation. Within any areas so designated, except for permanent improvements needed in experimental forests and ranges, no occupancy under special use permit shall be allowed, or the construction of permanent improvements by any public agency be permitted, except as authorized by the forester or the secretary.

The purpose of the experimental forests is to make permanently available, for silvicultural, range, products and other related forest research, areas as fully representative as possible of conditions in important parts of forest regions and large enough to meet present and foreseeable needs. In essence these areas are to be field laboratories for intensive investigative work. A secondary but hardly less important purpose is to provide for the demonstration of results, favorable or otherwise, of widely varying silvicultural and other forest practices. Each experimental forest is to be chosen on the basis that it adequately represents the subregion in which it is located as to forest types and sites and the conditions which underlie types and sites (such as soils, climatic variations and altitudinal range). Wherever possible each experimental forest is to include a "natural area" on which are to be preserved in an unmodified condition examples of the virgin growth of each forest or other vegetative type within each forest region, to the end that the region's characteristic plant and animal life and soil conditions shall continue to be available for scientific and educational purposes.

So far as can now be foreseen, from five to ten experimental forests will be required within each of the twelve or thirteen forest regions specified in the McSweeney-McNary Forest Research Act. Their areas will range from about 1,500 acres to about 5,000 acres, averaging about 3,500 acres, exclusive of the lands to be reserved as natural areas. They will not be so large as to impose any unnecessary burden of administration. Size will be governed primarily by the complexity of the type and by the growth rate of the tree species. The simpler the type and the higher the growth rate the smaller the area that will be required. In a subregion where it is not possible to find a satisfactorily representative single area it may be preferable to establish, as one unit, two or even three separate areas within easy working distance of the same headquarters.

For a natural area 1,000 acres is regarded as the minimum desirable under average conditions, but the acreage will vary with the type of forest involved or, possibly, with climatic and topographic conditions.

About a dozen such areas will be required in each forest region. Where areas suitable for experimental forests or natural areas can not be found on existing national forests, consideration will be given to the possibility of acquiring suitable areas by gift or exchange or, as a last resort, by purchase.

Experimental ranges will be established under the same principles as experimental forests.

On the experimental areas scientific and educational uses are to be dominant, commercial utilization and public occupancy subordinate. On natural areas commercial use will be prohibited and public use will be restricted as far as practicable. For convenience of administration and protection the areas will remain essential parts of the national forests on which they are situated, but responsibility for their management and use will rest wholly with the directors of the forest experiment stations. The boundaries of the natural areas and the principles to govern their management are to be established by the forester and are not to be modified except with his approval.

While natural areas will be established primarily to meet the needs of the Forest Service, their use by other research or educational agencies for purposes which do not conflict with Forest Service projects will be allowed under appropriate cooperative agreements approved by the forester.

The readiness with which title to lands can be established under certain of the public-land laws gives rise to some uncertainty at present as to the ability of the Forest Service to safeguard the integrity of the experimental forests and ranges and the natural areas from adverse occupancy and use, but it is believed that as soon as the system has taken definite form and its vital importance to public welfare is established and recognized Congress will make legislative provision for preserving the areas permanently.

The reference in the regulation to primitive areas repeats the language of an earlier regulation under which a comprehensive system of primitive areas is now taking form on the national forest.

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SCIENTIFIC APPARATUS AND LABORATORY METHODS

CULTURE MEDIA FOR OPALINIDAE

THERE seem to be three major desiderata in culturing Opalinids: (1) To supply predigested food. Without it I doubt the success of Larson and Allen's¹

experiments or any others. Despite Konsuloff's suggestion² that *Opalina* manufactures digestive enzymes and pours them into the "cecal" chamber of the frog host, there to aid in the further digestion of food for

¹ Larson and Allen, "Further Studies on the Reaction of *Opalina* to Various Laboratory Culture Media," *Univ. Kansas Science Bulletin*, 18: 8, April, 1928.

² Konsuloff, "Untersuchungen über *Opalina*," *Arch. f. Protistenk.*, 44, 3, March, 1922.

the Opalinas, we have no *evidence* of any digestion of any sort by Opalinids. (2) To avoid free oxygen in the culture fluid. (3) To avoid contamination of the culture medium. None of the several culture methods that have been suggested since the time of Pütter's first studies provide the first two desiderata mentioned. The third can perhaps be secured by frequent transfer of the animals to new culture fluid. Supplying predigested food or foods may not prove difficult. On the other hand, to keep the culture free of oxygen is not a simple problem. It requires a technique not yet developed, so far as I know, for culturing any protozoon, except such as will thrive within an agar or gelatin medium. Frequent changing of cultured Opalinids to fresh culture fluid without introduction of considerable oxygen by exposure to the air involves still further technical difficulty. It could doubtless be done with the aid of a gas mask in an oxygen-free room.

Protoopalinae, when kept in Pütter's or Locke's solution, either with or without bits of the rectal wall of the host, show signs of abnormality within a few hours, often within four hours or so. The large, metabolic chromosomes in the huge nuclei of these binucleated Opalinids, when carefully observed by one familiar with their usual appearance, show features which I have interpreted as signs of abnormality. "Sweating" of these chromosomes along their edges begins and develops increasingly, beads of what seems to be chromatin, judging by the staining reactions,³ appear and increase in size and number. These beads of chromatin sweat on the edges of the macrochromosomes have not been observed in the nuclei of *Protoopalinas* freshly taken from their host. It seems likely that they arise from an over-emphasis upon a normal process in the metabolic chromatin, making visible the sort of giving off of metabolic products that constantly occurs, only so slowly that they are carried off in liquid form as rapidly as they are developed. In addition to this sweating of the chromosomes, one observes in *Protoopalinas* kept a day or so outside the host a clumping of the chromatin in ways not noted in freshly taken material. This seems further indication of abnormal condition, as are, also, a slowing of the motion of the cilia and a delaying of the completion of fission, even when well started. These indications of "abnormality" can not be as well observed in the multinucleated Opalinids, whose nuclei, in all species, are much smaller than those in *Protoopalina*.

These facts, and the further fact that in this coun-

³ Feulgen's chromatin stain not employed.

try *Protoopalinas* are available for study only in a few regions and in the northeastern states not at all, have made me hesitate to attempt to develop a culture medium and culture methods. Without detailed observation of the minute indications of abnormality in the nuclei, such as are seen in *Protoopalina*, it would be difficult to test adequately the fitness of the culture medium, and without confidence in the suitability of the medium conclusions from experiments with cultured animals are unsafe.

On the other hand, given a suitable culture medium and procedure, the prompt response by *Protoopalina* by visible cytological changes under unfavorable conditions might render *Protoopalina* a peculiarly favorable test animal for studies of protozoan physiology.

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RAPID STAINING OF PLANT TISSUES IN THE BUTYL ALCOHOL PROCEDURE

THE time and trouble involved in the preparation of sections, which have been lessened by the use of n-butyl alcohol as described by Zirkle,¹ may be reduced further by saturating the last stage of butyl alcohol with safranin and leaving the objects in it overnight, and by counterstaining the sections with Light Green S. F. in clove oil.

The second change in paraffin will remove all color except from the specimens, which will remain deeply stained and so may be readily oriented for sectioning. The sections on the slides, on being taken from xylene which dissolves the paraffin, should be dipped in a 1:1 mixture of absolute ethyl alcohol and xylene and then counterstained. The slides may be handled separately, in which case a drop of the clove oil solution of light green may be added from a glass rod. This should be flooded within a few minutes with xylene, the slide then redipped in the alcohol-xylene mixture and returned to xylene whence it can be mounted at leisure. If the spiral spring clip and Stender dish described by Chamberlain² are used, 15 slides may be handled at one time and should be immersed in the stain.

This method has proved simple, rapid and effective with the various stem tissues tried. With buttercup roots, however, it was found necessary to add a stage of absolute ethyl alcohol just before counterstaining and to leave in this stain half an hour or longer.

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¹ SCIENCE, 71: 103, 1930.

² "Methods in Plant Histology," Chicago, 1924.